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LIBRARY OF THE HISPANIC SOCIETY, NEW YORK.—INTERIOR IN TERRA-COTTA.

ARCHITECTURE AND BUILDING

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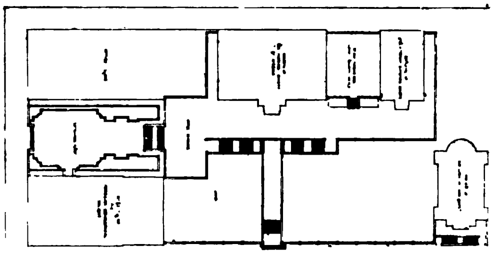
Volume XLIV. JANUARY, 1912 *Number 1*

A CIVIC GROUP OF EDUCATIONAL BUILDINGS

Designed by CHARLES P. HUNTINGTON.

A NOTEWORTHY group of buildings is being erected in New York City at 155th Street and Broadway, near Riverside Drive, which will be more familiar to New Yorkers as the trend of life and business pushes further up town and which are now fine examples of private enterprises for the public good. This group consists at present of the Library and Museum for the Hispanic Society of America, with its beautiful terraces, approaches and grounds; the Numismatic Society building, and the new home for the American Geographical Society (whose old building was on 81st Street and was itself a beautiful example of architecture but too small for the Society's present needs). Added to these is a new church, not yet completed for the Spanish Catholics of New York, which is shortly to be consecrated by the new Cardinal.

These buildings bear a broad significance in that they are examples of a well planned and organized civic group. They represent a nucleus which any broad-minded citizen would rejoice at seeing increased. On a site that a decade ago was a residence park extending over several times the area, it is with regret that one sees them bounded by the towering walls of apartment houses, the abode for the most part of a type of unappreciative humanity. It is to be hoped that another twenty years may see the extension of the group in the direction of Riverside Drive, so that they may have a clear frontage towards the Hudson River.



Location Plan of Buildings.

Eight years ago, when the district occupied by these buildings was called Audubon Park, a great deal of land was acquired by Mr. Archer M. Huntington for the purpose of housing his wonderfully valuable Spanish library and collections. Upon this land he erected a building which was finished in 1904 at a cost, with its approaches and terraces, of $600,000. It was entirely fireproof, with systems of heating, lighting, ventilation and burglar-proof arrangements of the most modern types. No wood was used in any part of the building, the window frames and doors being of solid bronze, and the interior doors and trim of metal made by the Dahlstrom Metal Door Co. A large hall with a balcony, and lighted from over-

THE AMERICAN GEOGRAPHICAL SOCIETY FROM THE TERRACE.
Otis Elevator
Book Stacks: The Snead & Co. Iron Works.
Charles P. Huntington, Architect.

head, is the main decorative feature of the interior, and the accompanying illustrations show two views of the decorative features and arrangements of this room. Constructed of terra-cotta, and with specially designed furnishings and wonderful coloring, this hall is perhaps the most unique and beautiful bit in America, and the priceless collection it contains of Hispano-Mauresque pottery, old illuminated manuscripts, archaeological collections, paintings, engravings, coins, maps, etc.—the whole collected in Spain and representing her history—make it a place of absorbing interest to the lover of archaeology, art and beauty. Such collections as that of ancient Spanish ironwork furnish opportunities to the student of architectural design to study and to derive ideas which may well be a benefit to modern work. To the art lover, the fine Velàzquez, the portrait of el conde de Olivarez, is irresistibly attractive.

The remainder of the building is occupied by large stack rooms, catalogue rooms, offices of the Librarian and Secretary, and the numerous arrangements, carefully studied by the founder and the architect for the working purposes of the Society and the preservation and protection of its priceless collections.

After the completion of the Hispanic Society's building, its founder, who was interested in many learned societies of New York, conceived the idea of trying to centralize them, for their common advantage as well as to create a group of architectural beauty that should adorn the city. To this end he presented land to the American Numismatic Society, who raised funds and erected an adjoining building; and later to the American Geographical Society, while his interest

THE HISPANIC SOCIETY BUILDING AND THE NUMISMATIC SOCIETY BUILDING ON THE TERRACE.

J. Clark Udal, Builder. Charles P. Huntington, Architect.
Otis Elevator.
Book Stacks: The Snead & Co. Iron Works. Metal Doors and Trim: Dahlstrom Metal Door Co.

ELEVATION OF THE AMERICAN GEOGRAPHICAL SOCIETY ON BROADWAY.
Charles P. Huntington, Architect.

in the Spanish people led him to offer them a plot of ground for their church, of which they were in need.

The Numismatic Society's building was built in 1907, and contains complete arrangements for the needs of that Society. It also has a hall, with a balcony, for the exhibition of the collection, as well as library, offices, and necessary working rooms. Unfortunately the funds available for this building necessitated its being built of reinforced concrete with stucco finish, instead of limestone. Connecting it with the Hispanic Library is a raised terrace, covering two stories underneath, which was necessitated by the requirements of the latter Society. The two buildings will ultimately be connected above ground, and accompanying wings to the east will follow.

As the idea of expansion grew, the architect determined upon a general plan; and the new building for the American Geographical Society is part of its development. This building, at the corner of 156th Street and Broadway, has but recently been finished, and cost $300,000. It is 125 feet long by 65 feet wide, and is built entirely of limestone. As these buildings will form part of a general scheme, the height of the cornice and exterior style conform to the Hispanic Society's Library; but a terrace sightly below the street level gives the

THE AMERICAN GEOGRAPHICAL SOCIETY BUILDING FROM BROADWAY.

John Clark Udal, Builder.
Hardware: Norwalk Lock Co.
Metal Doors and Trim: Dahlstrom Metal Door Co

Charles P. Huntington, Architect.

SIDE ELEVATION OF AMERICAN GEOGRAPHICAL SOCIETY.

Charles P. Huntington, Architect.

READING ROOM OF THE HISPANIC SOCIETY.

opportunity for a strong lower story below the colonnade, and the architect has arrived at beautiful proportions. In all probability a future edifice will be erected at the corner of 155th Street and Broadway, conforming to the architecture of the Geographical Society's building and making a superb entrance from Broadway to the raised terraces upon which the Hispanic and Numismatic Societies' buildings are now placed, and where it is hoped the future will develop a fine group around an interior court or garden.

The American Geographical Society building has an interior splendidly suited to the requirements. One part, represented in the façade as a separate motive, contains a six-storied stack room to contain 260,000 books. The interior of this is exclusively of steel construction, done by The Snead & Co. Iron Works, and is the most modern and perfect in library construction. Large map rooms, offices, editorial, reading, lecture and exhibition rooms, complete the interior arrangements.

The Spanish Church, or more correctly speaking, Chapel, is situated on 156th Street, near Riverside Drive. This is a gem of architecture, Roman in style, built of terra-cotta and brick, and placed on a terrace at the top of a flight of steps. This Chapel will form no part of the ultimate arrangement of the group already mentioned, but its style conforms to that of the other buildings.

It is to be regretted that no illustrations can as yet be given of the interior. It is classic in treatment, and the Church

FRONT ELEVATION

ELEVATION OF TERRACE STEPS

FRONT ELEVATION OF THE SPANISH CATHOLIC CHURCH.
Charles P. Huntington, Architect.

Glass and Decorative Company have furnished beautiful stained glass windows, while the Stations of the Cross are fine decorative paintings. A high altar, designed by the architect and costing $20,000, is in process of erection. It is a beautiful Renaissance design, constructed of Sienna marble. Side altars of the same material contain paintings by noted artists.

The architect of the whole group of buildings is Mr. Charles P. Huntington, who has made these buildings a credit to New York City. The future will probably show, when the scheme of development is continued, the group to be one of the most interesting examples of concentrated effort towards a general scheme that exists outside of most universities. No educational society is absolutely complete in itself, and with such a grouping, the immediate data for consultation contained in the library and collection of each society is made conveniently accessible, an arrangement that works for the common benefit of the societies as well as of the student; and as time goes on, centralization in heating, lighting, and a general utilitarian co-operation will follow.

These buildings were all erected by John Clark Udal.

Book Stacks in Geographical Society Building Built by The Snead & Co. Iron Works.

THE SPANISH CATHOLIC CHURCH APPROACHED FROM 156TH STREET.
John Clark Udal, Builder. Charles P. Huntington, Architect.

SWISS CHALET DESIGN

ARTICLE III.

By WM S B DANA, B. S.

THE frame-work, or shell, of the châlet was the basis of the two previous articles. The essential structural motives, together with a reference to the ornamentation, with relation to the construction, and the analysis of actual examples, formed their principal subject matter.

It is doubtful if the present moment could be improved upon for the exposition of two cardinal features of châlet design which are in themselves structural, and yet are not necessary to the main construction, being really "by-products" of it—the balconies and gables.

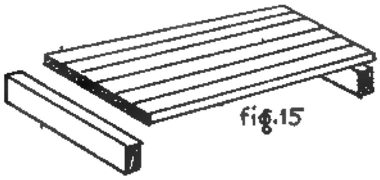


fig.15

These dominate the design to such an extent that, in the case of the former, they often encircle the building, and in the latter instance they sweep beyond the walls at the front a distance of ten feet or more, and at the sides, sometimes

'eet of the ground.
of the utmost im-
ıe depths of shade
ːy cause and also
y chosen as the
t richness and in-
the case of bal-
ally true of the
f their balustrades
and bracket-work
s. In the case of
'turesque curvings
ir great consoles.

and the reflected shadows of these, and the rib-work of the gable's under portion. The Λ-shaped gable wall and its treatment with relation to the whole design will be dealt with in a later article.

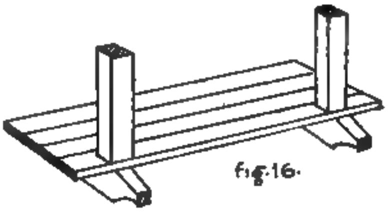


fig.16.

A common starting point in the study of these secondary structural elements is essential. If we suppose, then, that a floor-beam or cross-wall beam at any story is made to protrude through the outer wall a few feet, we will have the basis of balcony construction. Two of these beams, the proper distance apart, with boards or planks laid across them, are, crudely, a balcony—minus the means of protection from falling; thus, Fig. 15. A three-foot post standing on each outer corner form the points of support for

the low protecting walls along the front, and at the two end edges, as in Fig. 16. A front rail and two end rails, connect-

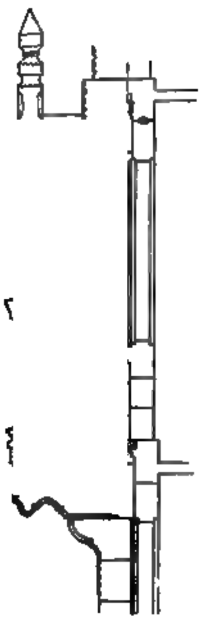


FIG. 18. SECTION OF BALCONY—GRINDELWALD.

ing the tops of the posts with the main wall, complete the protecting frame; upright boards, placed tightly, edge to edge, and running from floor-edge to rail, finish the enclosing wall. If for the sake of design and appearance, as well as construction, a greater number of beam-ends and a much longer row of them are desired, also a lateral beam supporting their outer ends, itself in turn supported by diagonal braces, or on the ends of consoles, the diagram in Fig. 17 will represent the result.

The methods of decorating and moulding all parts of this structure may be seen in the accompanying cuts and illustrations. In Fig. 18 a section of a balcony at Grindelwald is given. Fig. 19 is a cut of a balcony at Varembo.

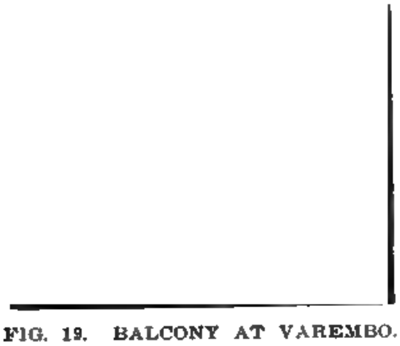


FIG. 19. BALCONY AT VAREMBO.

It will be seen that all beam-ends are moulded, and their under edges chamfered. In the balustrade, the post and rail framework form a panel for the vertical strips. The characteristic ornamen-

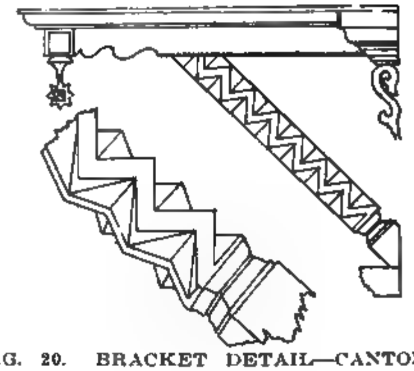


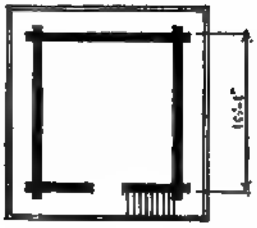
FIG. 20. BRACKET DETAIL—CANTON-BERNE.

tation of these strips by means of perforations, large and small, arranged on vertical and horizontal axes, also their scooping at the bottom, and the capping of the posts at the top, speak for themselves. The brackets are the projecting, as distinguished from the brace form. In the section of the granary at Golderen, on page 13, which was spoken of in detail in a previous number, the section of the balcony, the balustrade and consoles, as well as the corresponding parts of the gables, are here clearly shown. Below this is the interesting châlet on the Lake of Brienz with a balcony nearly surrounding it. The above cut, Fig. 20, is a form of bracket which occurs almost universally.

An example of a balustrade at Eblingen is given in Fig. 21.

The geometry of the châlet gable may be seen in the diagram, Fig. 22. The elemental portions thereof may be seen at a glance. A B C J K L represent the soffit; J K L D E F represent the outline of the gable wall proper; the

FIG. 21. BALUSTRADE AT EBLINGEN.



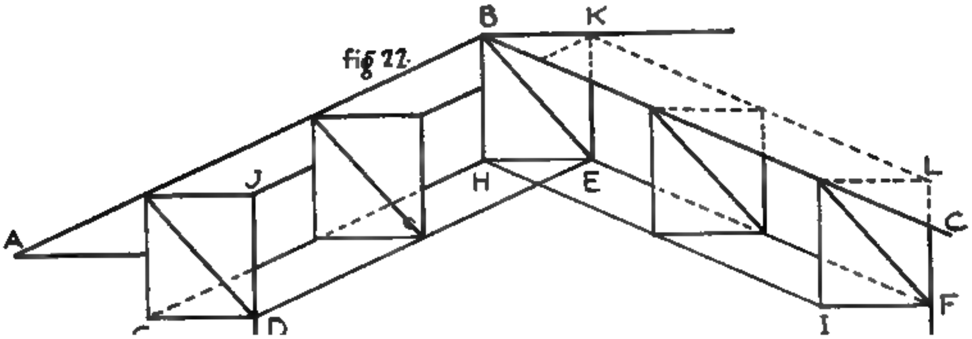
Plan

SECTION AT GRANARY—GOLDEREN.
(Graffenried & Stürler.)

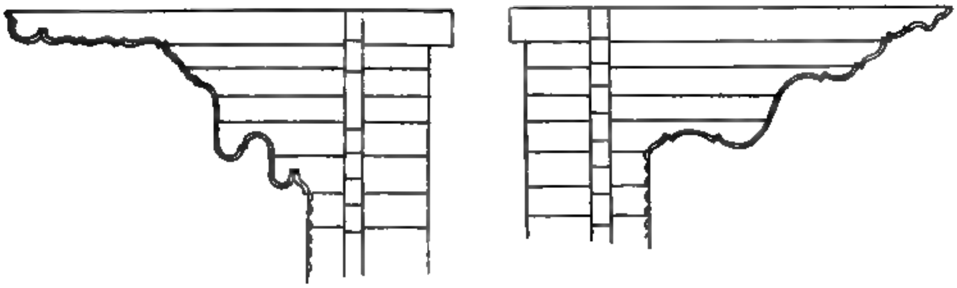
CANTON DE BERNE—BRIENZ.
From Varin's "l'Architecture pittoresque en Suisse."

CHALET, CANTON, GENEVA.
Ody & Co., Manufacturers, Geneva.

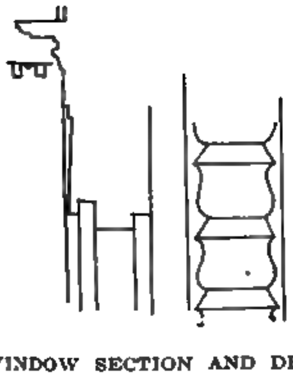
CHALET DU PLATEAU DU PETIT LANCY.
Ody & Co., Manufacturers, Geneva.



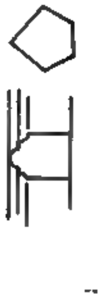
EXAMPLE OF GABLE, CANTON GENEVA.
Spring Frères, Geneva, Manufacturers.



GABLE CONSOLES



WINDOW SECTION AND DETAIL.



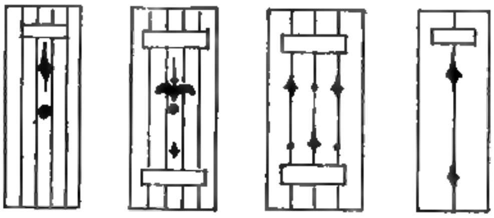
DOOR DETAIL.
Graffenried et Stürler.

CHALET AT VAREMBO.
Spring Frères, Geneva, Manufacturers.

proportion of the space between the gable wall and gable soffit occupied by the consoles is easily apparent. As an example of a gable which closely corresponds to the diagram, the cut below Fig. 22, of a gable in Canton Geneva, is given. Other excellent examples may be seen in the accompanying cuts. Two classic examples of châlet consoles from Graffenreid and Stürler are given; also window, door and shutter details.

In passing it may be proper to refer to the recessed balcony, or alcove, a modern substitute for the overhanging or projecting balcony. The example above is very characteristic, with its flat-arched head springing from corner brackets. The water tables over the other windows, supported on miniature brackets, also the row of moulded beam ends over the central double window are most characteristic of châlet design. The shutters, also, should be noted, and the wall carving above the row of beam ends.

(*To be continued.*)



SHUTTERS.

THE HOLLOW-TILE FIREPROOF HOUSE

Article IV.

By FREDERICK SQUIRES.

FOUNDATION WALLS.

Where so indicated on plans, the foundation walls from the top of the footings are to be constructed of nine-hole 12 inch x 12 inch x 12 inch hollow-tile blocks or of six-hole blocks laid up to give a triple air space.

EXTERIOR WALLS AND BEARING PARTITIONS.

The exterior walls and partitions are to be of the thickness shown on the plans and must be in accordance with the foregoing conditions of quality.

SUBDIVIDING PARTITIONS.

Subdividing partitions are to be of hard-burned terra-cotta or gypsum blocks. All partitions are to be started on the structural floor and wedged against the floor slab above.

JAMBS.

All double-hung windows are to have jambs made by running the "Texture-Tile" beyond the backing to receive the window-frame box. The space between the blocks and the frame box is to be well filled with mortar to prevent the passage of air or moisture through the same.

LINTELS.

The lintels over all openings are to be double lintels, with special lintel blocks reinforced with steel bars and concrete, as per detail shown on detail sheet. Care must be taken not to bulge the lintels outward when placing the concrete.

SILLS.

All sills are to be formed of "Texture-Tile," laid with a slight pitch, so as to shed water. Care must be taken to fill all joints so as to prevent moisture working through.

ARCH OPENINGS.

All arched openings shown on the plans are to be built of two-course rollock arches of "Texture-Tile," carefully laid on substantial centers.

FLOOR BEAM BEARINGS.

Terra-cotta slabs, 1 inch thick, are to be provided and set in the walls under all floor beams as bearing plates for same. These slabs are also to be used for working up to levels and story heights when the full or half blocks do not work out correctly. Similar blocks, ½-inch thick, are to be used in joint, if difficulty is experienced in obtaining a wide face joint in the "Texture-Tile."

ROOF PLATES.

Three-quarter-inch bolts, 30 inches long, provided with nuts and washers, are to be embedded at intervals of 5 feet in the wall under the roof plate and are to project 6 inches above the top of the wall. These are to provide fastening for the plate. Cement grout is to be filled around the bolts before placing the roof plates.

FLOOR AND ROOF CONSTRUCTION.

The floor and roof constructions are to be of the type known as the combination hollow-tile and concrete arch construction, consisting generally of 4-inch reinforced concrete beams, spaced 16 inches on centers, with hollow-tile blocks between, all of which are to have at least 4 inches bearing on the walls.

TILE.

The depth of the tile filler blocks is to be regulated by the span and load to be carried and is to be of the size indicated on the plans. All blocks are to be wet before concrete is placed, so as to insure a good bond with the concrete.

CENTERS.

Centers are to be of such size as to insure their non-deflection under the weight of the wet concrete, and are to be provided in such quantity as to insure speedy work. Care must be taken not to remove the centers before the concrete is hard, and under long spans a center line of supports must be maintained for at least three weeks after the concrete has been poured. In cold weather the centers must be left in place until their removal is directed by the architect.

WATERPROOFING.

All foundation walls are to be waterproofed by painting on the outside with two coats of waterproof paint or by a ½-inch coat of rich cement mortar.

WIRE LATH.

All joints between the stud work and masonry and all chases for heating, lighting and plumbing are to be covered with an approved brand of expanded metal-lath. All exterior corners are to be protected with an approved corner bead.

PLASTERING.

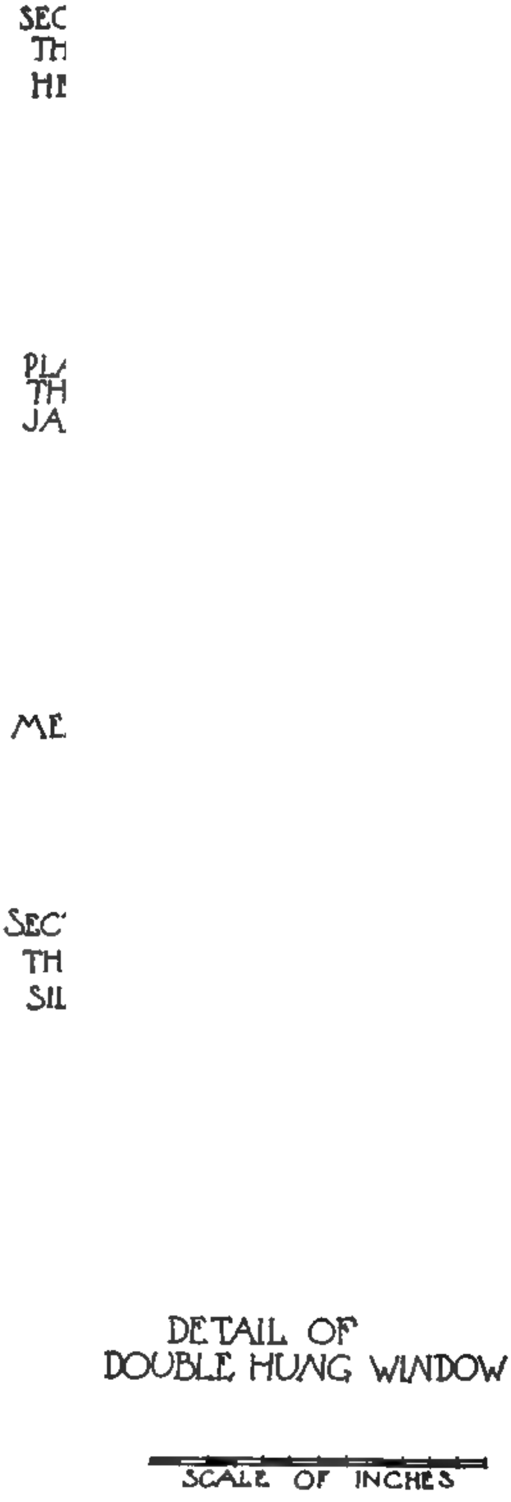
All walls, ceilings, insides of all closets, and soffits of all stairs are to be plastered with King's Windsor, Adamant, Rockwall, or other equally good cement plaster, put on according to the manufacturer's directions, and finished with sand finish in all cases. All plastering is to be heavy enough to overcome all inequalities in the tile.

There is to be no plastering in storage space of unfinished attic, but all walls and ceilings are to be whitewashed with two coats of lime whitewash. At completion, and after all mechanics have left, except painters, the plasterers are to cut out all pits, stains and cracks, refinish surface, and leave the job clear and perfect.

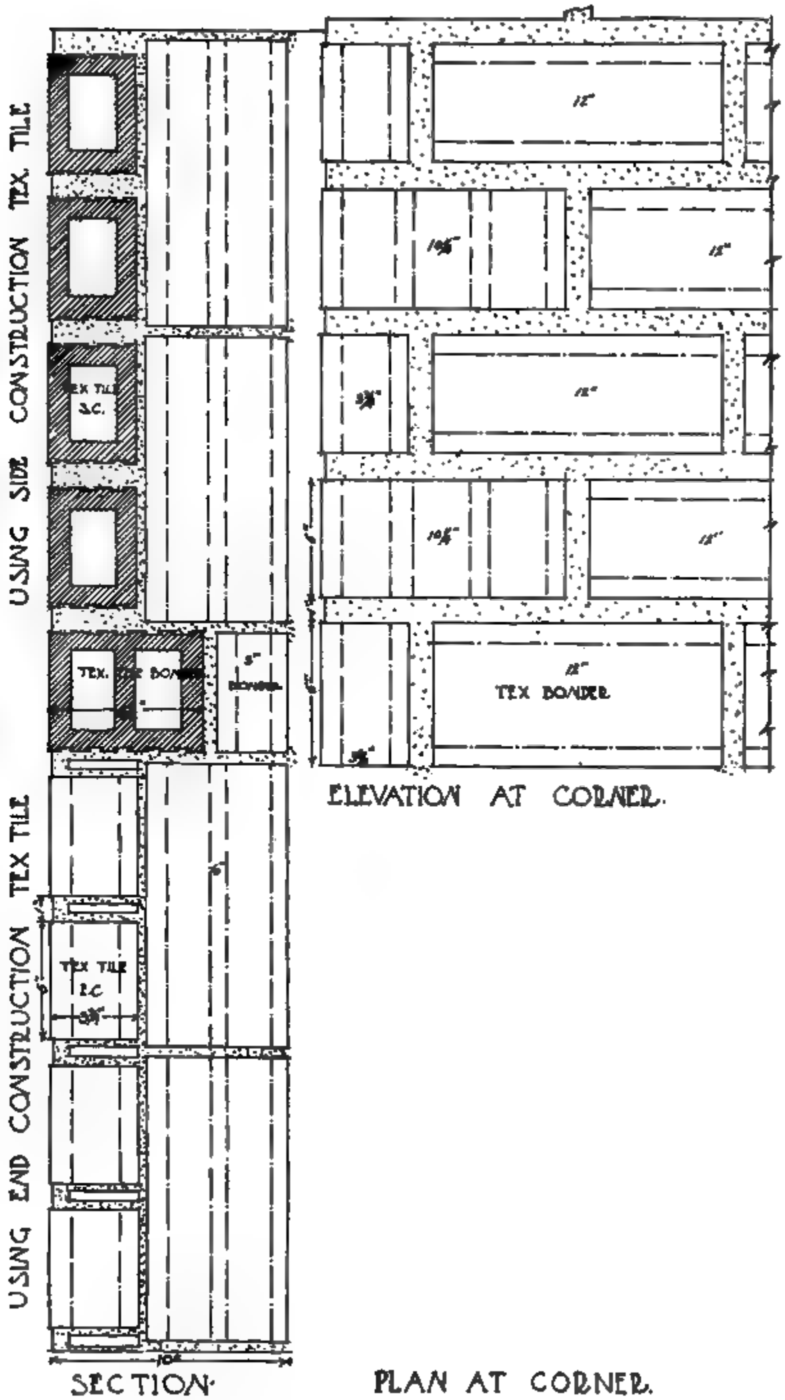
All plastering is to be true and straight and from ceiling to floor in every case.

FLOORING.

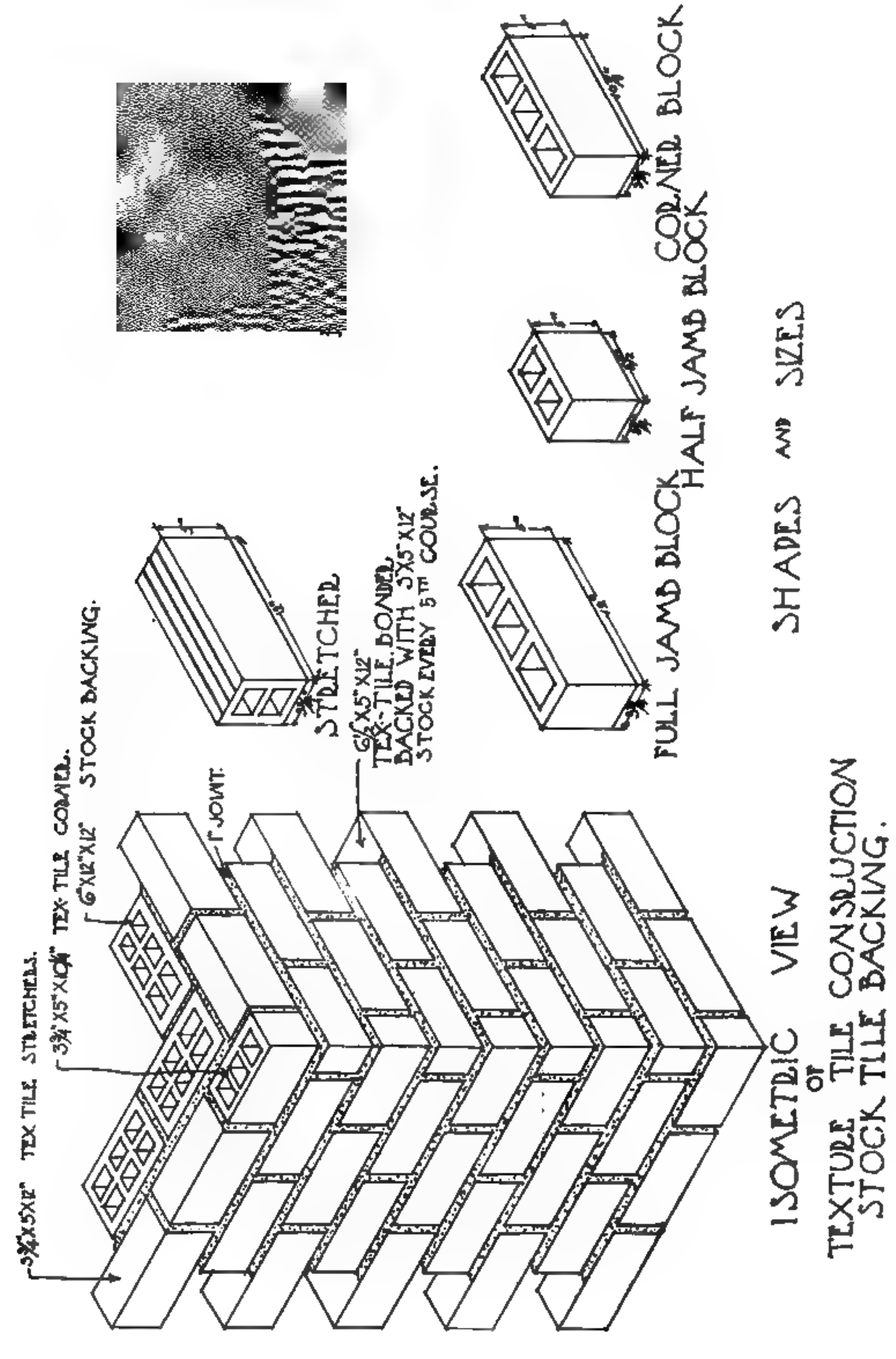
After the top of the rough floor has been leveled up with cement by the ma-



DETAIL OF DOUBLE HUNG WINDOW



DETAIL OF TEXTURE TILE CONSTRUCTION.


3¾"X5"X12" TEX TILE STRETCHER.
3¾"X5"X10½" TEX-TILE CORNER.
6"X12"X12" STOCK BACKING.
1" JOINT.
STRETCHER
6½"X5"X12" TEX-TILE BONDED BACKED WITH 3"X5"X12" STOCK EVERY 5TH COURSE.
FULL JAMB BLOCK
HALF JAMB BLOCK
CORNER BLOCK
SHADES AND SIZES
ISOMETRIC VIEW OF TEXTURE TILE CONSTRUCTION STOCK TILE BACKING.

son, a composition or tile floor is to be laid as indicated. The tile is to be 6-inch x 6-inch red Welsh quarry, Rookwood, Moravian, or other suitable tile, and all set in cement.

The composition floors are to be Asbestolith, Kompolite, Marbleoid, Taylorite, or equal, laid according to the manufacturer's directions and provided with a base of the same material.

—

The following materials and work are influenced by this construction, and we offer herewith various suggestions which may prove of assistance in writing the full specifications for them.

The carpenter should provide for his nailing by plugging the walls or directing the mason to lay porous blocks at proper points whereto trim, base, shelves, wainscots or any woodwork may be secured. He must be careful not to pierce his outside walls with plug fastenings for wooden decorative features, as these are sure to cause a leak.

If he sets up the forms for floors, they should be crowned and very securely braced to prevent the dead load of the floor construction and the weight of the workmen walking about on the floor before it has set from deflecting the finished beams.

He should be specially careful not to pull the girder forms too soon, as the shear-resisting strength of concrete develops more slowly than the compressive strength. If the refinements of window and door details shown on the detail sheet are carefully followed, the chances of leakage at these points will be minimized, and it may be remarked that these points are especially vulnerable.

It is to be remarked that wood will always shrink away from concrete, and this fact has to be taken seriously into account. In general, too much emphasis cannot be laid on extreme care and thoroughness wherever masonry and woodwork come in contact.

The sheet-metal worker must provide carefully against leakage, as water is the greatest enemy of tile construction. Flashing is difficult on account of the large size of the tile compared to the brick which he is accustomed to flash. The cap-flashing should be built into the tile-work as it goes up, and every architect knows what a difficult thing it is to get this done, because the sheet-metal man is seldom on the job at that stage of the operation. Heating, lighting and plumbing involve the same difficulties, those of cutting the walls and crossing the pipes on the floors. Nothing is so heartbreaking as to see a carefully erected tile wall cut all to pieces by these three trades. Such cutting may seriously weaken the structure, and one is tempted to lay down the general rule, however radical, that all vertical heating and plumbing pipes must be exposed. If the walls must be cut, it is the business of the architect to consult with the subcontractors and work out the places where the cutting will do the least structural damage. The horizontal pipes are apt to be crossed on top of the floor slab and greatly increase the amount of cinder fill necessary to cover them. Heating pipes that run covered in concrete should have sleeves to allow for expansion and contraction. If the electrician, plumber and heater provide the architect with rough piping plans, nearly all difficulties may be avoided in the office and a great deal of trouble averted. It may be remarked here that the heating contractor may figure less heat loss through hollow-tile walls than in any other known construction.

(*To be continued.*)

THE CHICAGO CITY HALL AND THE COOK COUNTY COURT HOUSE.

Holabird & Roche, Archite

Terra-Cotta: Northwestern Terra-Cotta Co.
30,000 Barrels Chicago "AA" Portland Cement Used.
Evans "Crescent" Expansion Bolts Used.

THE CHICAGO CITY HALL

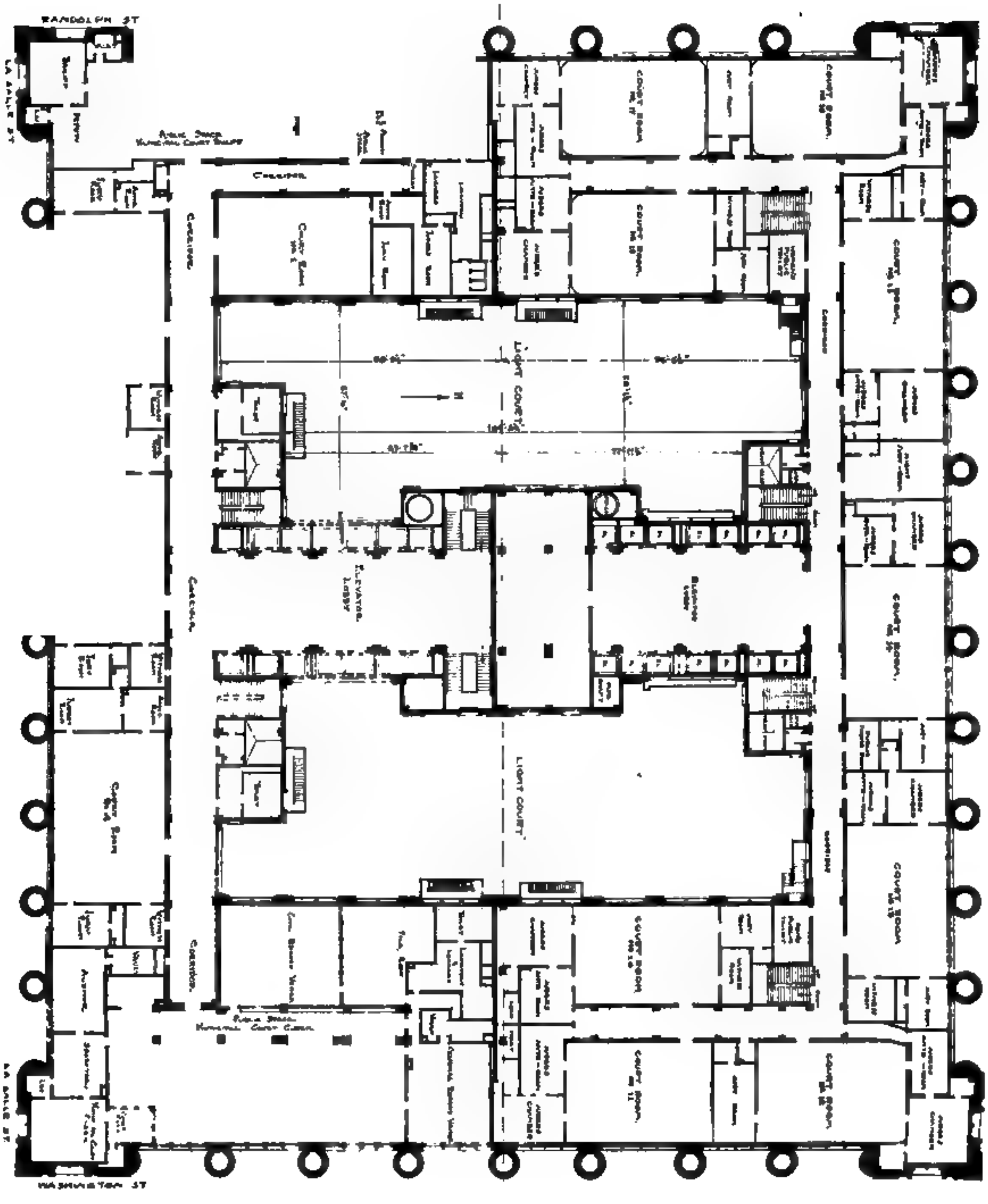
HOLABIRD & ROCHE, Architects.

SOME years ago we presented illustrations accompanied by plans of the Cook County Court House, which occupied one-half of the site devoted to the City Hall and the Court House. Less than a year ago, the Chicago City Hall was completed, filling in the other half of this plot. This fine building, which in its erection was characterized by honest methods, reflects credit in its completion on the city government for a great undertaking well fulfilled. The combined buildings cost about $10,000,000, and consist of twelve stories, 205 feet being the total height. The Court House contains 56 court rooms in the upper stories, and is one of the largest buildings devoted to the purpose in the world. The City Hall, comprising the other half of the structure, is one of the largest municipal buildings.

The City Hall, which is the principal subject of this article, is a model example of such a structure designed to meet the needs of a great city. The lower story contains the great entrance corridors and various offices as shown by the plan. The second story has the Council Chamber as its principal room. This Council Chamber is designed in Italian Renaissance style, and is finished throughout in dark English oak. Its walls are panelled and its ceiling beamed in this wood. Broad paintings form a frieze about the room. The dimensions of the room are 97 feet in length by 61 feet in width, with a ceiling height of 28 feet. The present seating capacity provides for 70 aldermen, but there is sufficient additional space in the room for extra desks if the body should be increased in number.

In construction the building, like many other Chicago structures, rests on caissons which are carried down to solid rock, varying distances of from 75 to 114 feet. The frame is of steel and the fireproofing of tile. The exterior is of granite. Some 30,000 barrels of Chicago Portland cement were used in the construction, and characteristic of the quality of the work done throughout the building are the recommendations given this material. Prof. A. N. Talbot of the University of Illinois, says "I have found every indication that the cement used in the concrete work was of excellent quality." It seems that this general opinion could be applied to the whole construction. It would be well if the same could be said of every enterprise carried out under municipal control.

PLANS OF THE FIRST AND SECOND STORIES, CHICAGO CITY HALL.
Holabird & Rocl



PLAN OF THE EIGHTH STORY CHICAGO CITY HALL AND COOK COUNTY COURT HOUSE.
Holabird & Roche, Architects.

ELEVATOR FOYER, CHICAGO CITY HALL.

Ornamental Iron and Bronze: The Winslow Bros. Co. Holabird & Roche, Architects.

COMMONWEALTH TRUST COMPANY BANKING ROOM IN THE BOSTON STOCK EXCHA BUILDING

Bronze Counter Screen: The Gorham Company. Peabody & Stearns, Archite

NATIONAL SAVINGS BANK, NEW HAVEN, CONN.
Brown & Von Beren, Architects.

MERCHANTS NATIONAL BANK, NEW HAVEN, CONN.
Dennison & Hirons, Architects.

FIRE PROTECTION AND THE ARCHITECT

Comments on Some Current Literature With Introduction by Edwin O. Torbohm.

THE ARCHITECT'S OPPORTUNITY

JUST at this time, when the City of New York is organizing its Bureau of Fire Prevention, how are the architects prepared to meet the criticisms to which the properties of their clients are likely to be subjected? How far will they be able to anticipate the requirements of this bureau in their new creations?

Knowledge of the law has not seemed necessary to raise the suspicion in the minds of many that some of the provisions of the Hoey Fire Prevention Bill are unconstitutional. Fire Commissioner Johnson himself has referred to this measure, which invests him with so much authority, as "absolutely revolutionary and drastic." Added to this is the fear that in their eagerness to appease a section of the community still swayed by the hysteria so prevalent immediately after the Asch Building holocaust—that these men, untrained in practical fire prevention, may ruthlessly order undesirable or unnecessary changes or additions to premises reasonably safe. How else will the architect be in a position to advise his client logically and definitely except he acquire—and quickly—a knowledge of the principles underlying real fire-prevention?

For these principles the bureau inspector and his superiors will perforce resort to the regulations of the fire underwriter to whom this is no new subject. The intelligent application of underwriters' rules requires a degree of training acquired only through an intimate and extended experience. The reasons back of the rules, however, are simple and readily comprehended. The acquisition of a knowledge of these principles is equally the privilege of the architect as of the bureau inspector, and places at the disposal of the former a media by which may be measured the reasonableness or unreasonableness of the rulings of the latter.

Under a reasonable interpretation there will be no conflict, but the thought of the possible chaos into which we may be plunged by unreasonable demands—unless prepared to demonstrate their unreasonableness—is disquieting.

It is not to be presumed that the architect, whatever his ability, may hope to acquire in a brief period the full understanding of that science which it has taken the insurance engineer a lifetime to develop. It is not necessary that he should. The details may well be left to those who are making their refinement a specialty. The fundamental principles, however, can and must be studied and absorbed if the architect aspires to co-operate with the various agencies now actively engaged in fire-prevention, or hopes to combat successfully the erroneous rulings which may be applied to the properties erected under his supervision.

EDWIN O. TORBOHM.

In sequence to Mr. Torbohm's thoughts, we present some brief reviews of current literature which will prove instructive reading to both designer and builder. We quote from "An Appeal to Architects and Builders," a paper published by the Home Insurance Company:

"Well constructed buildings are good risks to us, and we hope to be able to demonstrate to you—and through you

to your clients—that a good building is best for you to plan and build, and for them to own. Many considerations are weighed by a man who sets out to find a house: if a dwelling for himself, comfort and beauty; if a store, convenience and suitableness; if a factory, strength and adaptability. But, whatever other conditions are considered, there is one that, first and last, influences and generally dominates and controls, and that is the cost. That must always be counted. Is it always counted wisely? What is the true economy in house-building? Admitting that a good building, even at a lower insurance rate, is better for us, can we establish that it is better for the owner? If this can be done, will it not be your pleasure and to your advantage to advocate a wise initial outlay of somewhat larger sums for building, to make good brick, stone or concrete walls; metal, tile or slate roofs; substantial chimneys from the ground—condemning and opposing the use of poor materials as not only inferior but actually in the end more expensive from every point of view?"

In proof of this argument the Home Insurance Company presents comparative estimates of cost for the construction of a given building by several methods. It then shows the depreciation in wooden construction and the cost for repairs, giving the periods of years which it would take for the excess original cost of a brick structure to be equalled by the repairs on a wooden one. Similar tables show the different rates of insurance on building and contents, the amounts of the premiums and the comparison between the initial saving and incidental expenses later which produce a higher continuous cost. The paper presents the argument in concise and interesting form that is very instructive.

"Individual Fire Fighting" is the t of a pamphlet issued by the Roches Chamber of Commerce. This gives p ticular attention to the two great f preventive inventions—automatic spri lers for the extinguishment of inter fires, and fireproof windows glazed w wire-glass for protection against ternal hazard. We quote the ten vantages of automatic sprinklers as Rochester Chamber of Commerce lines them.

"1. It is on duty all the time.

"2. It puts all of its water on the e pace to do the most good. Compare this the fire hose of the city departments apply only about half the water on the l of the fire owing to the angle at which must be directed.

"3. The sprinkler system operates where it is needed. It does not flood th tire building.

"4. It works just as effectively in a full of smoke as anywhere else and sta the job when the heat would drive the men away.

"5. It is effective at the top of a fif story building where a fire hose wil reach. The city fire departments are sev handicapped above 90 feet from the gr

"6. It is the one great protection conflagrations. It holds a fire back enough for the fire department to under control. In many cases it has the building so protected.

"7. The sprinkler system fireproof stock contained in a fireproof buildin

"8. Sprinklers can be used in chu theatres and schools in the danger only and will not disfigure the buildir

"9. A sprinkler system will pay for in from five to seven years through t duction of insurance premiums. Many panies will install a sprinkler system w charge, except for the difference betwe former premium and the new one for years. At the end of that time, the sy your property and your insurance is reduced.

"10. During the first quarter of 1 1,086 fires in sprinkled risks, 646 wer tically or entirely extinguished by au sprinklers, 403 were held in check same means, and in but 37 cases w action found unsatisfactory."

The section on fire retardant forth the reasons why wire-glass i al frames is most economical in t The recommendations under "Co tion" are almost equally interest

BUILDING AT THE SOUTH EAST CORNER OF 20TH STREET AND 4TH AVENUE, NEW YORK.

H. H. Oddie, Builder. Rouse & Goldstone, Architects.

Steel Rolling Shutters: James G. Wilson Mfg. Co. "Peelle" Counterbalanced Fire Doors.

THE WHITE HOUSE, 31ST STREET AND 4TH AVENUE.

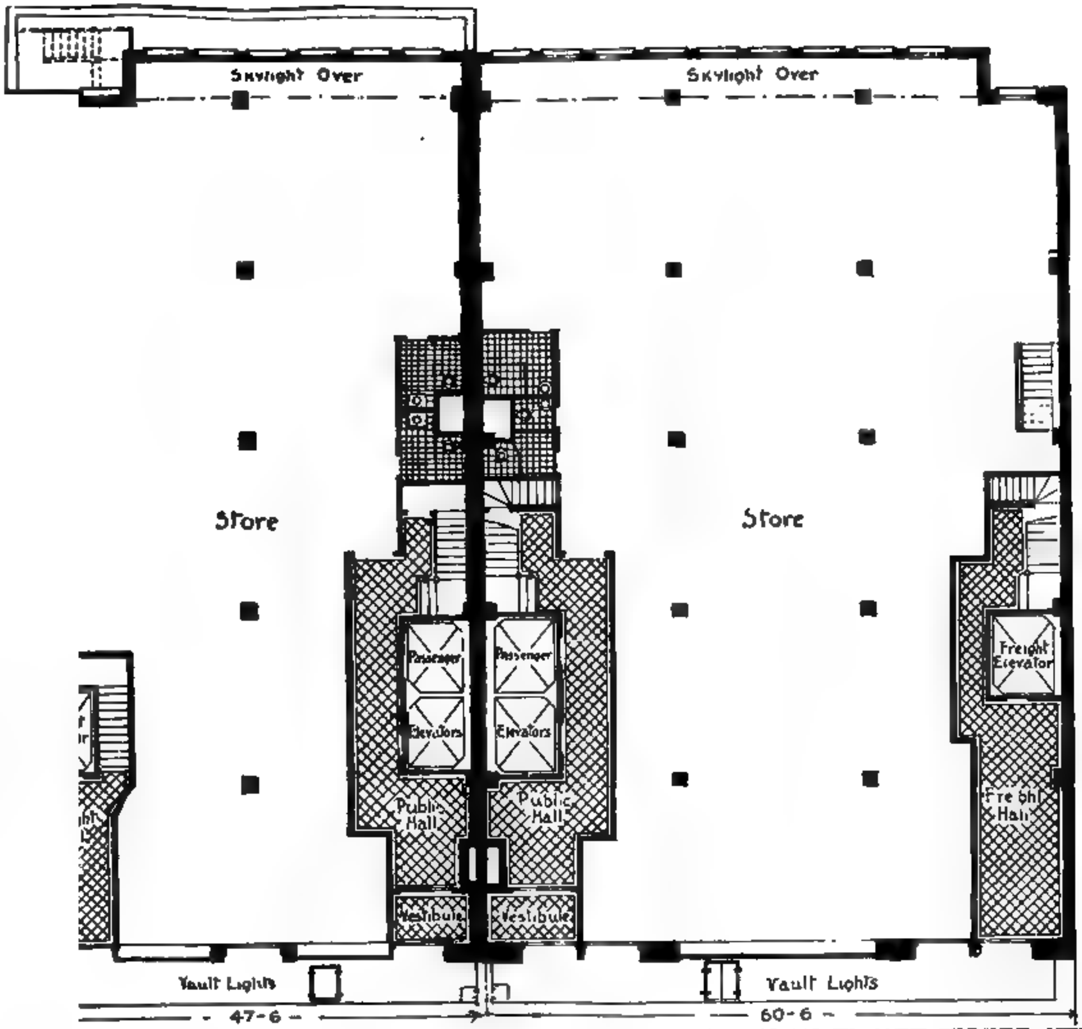
Architectural Terra-Cotta, Federal Terra-Cotta Co. Henry B. Herts, Archt

Otis Elevators.

Court Brick: Harbison-Walker Refractories Co.

Rockwood Sprinkler System.

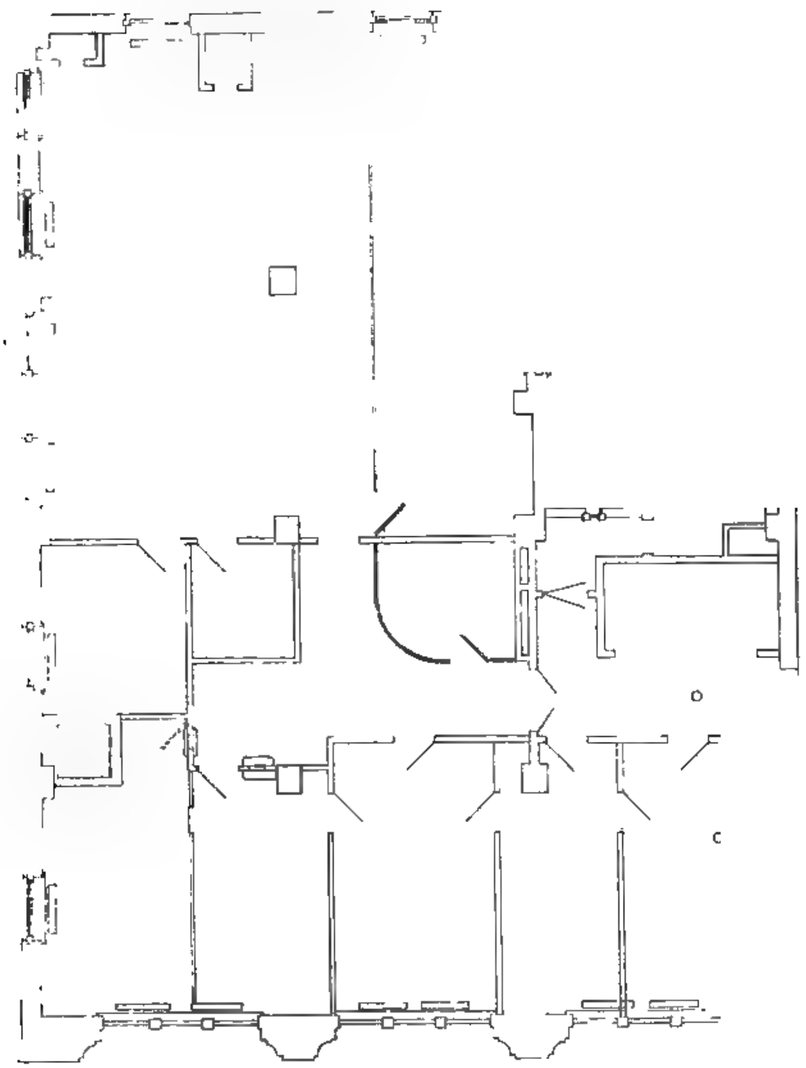
Fireproof Doors, Reliance Fireproof Door Co.



MERCANTILE BUILDINGS, 135-145 W. 29TH STREET, NEW YORK. F. C. Zobel, Architect.

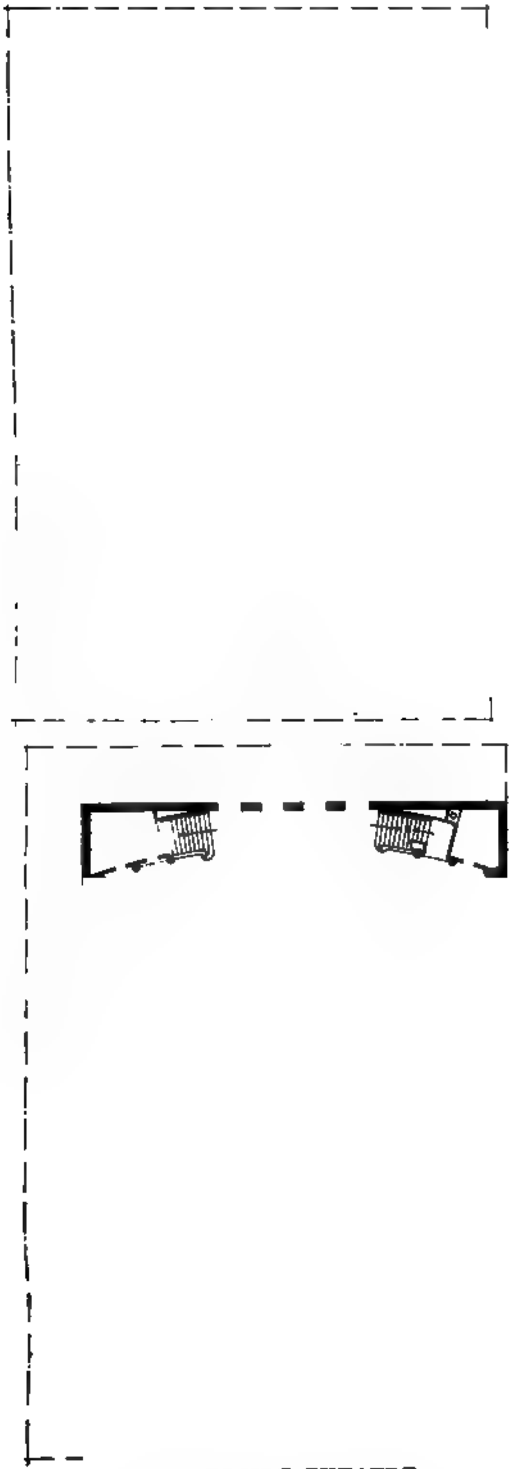
Front Brick: Harbison-Walker Refractories Co.
Fireproof Windows: S. H. Pomeroy Co., Inc.

"Flushovalves" Used.
Plumbing Contractor: Pasquale Lauria.



BUILDING FOR THE CONSOLIDATED GAS COMPANY OF NEW YORK, 20TH STREET AND 4TH AVENUE.

Builders: Geo. A. Fuller Co. H. J. Hardenbergh, Architect of Façade.
Metal Lath: Arthur Greenfield, Inc.
Heating & Ventilating; Boyd Equipment Co.
Front Brick: Harbison-Walker Refractories Co.
Metal Doors and Trim: Dahlstrom Metal Door Co.
Otis Elevators.



RIVERSIDE THEATRE.
Orchestra and Balcony Plans.
Thomas W. Lamb, Architect.

Builders: T. A. Clark Co. ELEVATION OF THE DE KALB THEATRE, BOROUGH OF BROOKLYN, N. Y. Harde & Short, Architects.

THE DE KALB THEATRE, BOROUGH OF BROOKLYN, N. Y.

Harde & Short, Arcl

Builders: T. A. Clark Co. Photographs by courtesy of the Brooklyn

Evans "Crescent" Expansion Bolts Used.

Draperies, Furniture and Carpets: Fraas & Miller.

Electrical Equipment: Electrical Construction & Supply Co.

MINER'S EMPIRE THEATRE, NEWARK, N. J.

McMurray & Pulis, Architects

Lighting Fixtures: The Browe Co.
Ornamental Plaster: Dominic A. Walsh.
Rockwood Sprinkler System

A STUCCO HOUSE

THE accompanying drawings sl the exterior, ground and ond story plans of the stucco hous Charles P. Rawson, architect, at I enswood Manor, Chicago. The exte is stuccoed in a deep yellow, and trimmings are white, with window and downspouts painted blind gı An attractive feature of this home large living porch, which is screene and which is entered only from house. The entrance door is on side and protected by a small per The house is provided with hot-w heat, electric light, hot and cold w

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BOOK REVIEWS

PLUMBING AND HOUSEHOLD SANITATION. By J. Pickering Putnam. Doubleday, Page & Co., Garden City, Publishers. Price, $3.75 net; postage, 35 cents.

This elaborate volume, which is dedicated to the Boston Society of Architects, is compiled from a course of lectures delivered before the plumbing school of the North End Union, Boston. The author presents the subject in 44 chapters and has collected an enormous mass of material relative to sanitation and plumbing matters.

The work possesses historical significance in that the author has made a deep research into the early development of sanitation. In this connection the illustrations are profuse and interesting. The humanitarian side of the question is dealt with, and the necessity of educating the populace at large to a knowledge of the requirements of proper sanitary equipment is dwelt upon. Disease and its production by inefficient sewage disposal is considered in several chapters. In the larger portion of the work which deals with the appliances themselves, the illustrations are very numerous and the appliances used by nearly every nationality in every period of civilization have been illustrated. As an historical treatise on the subject of plumbing, this book will find a place on the shelves of many architects and all contractors who possess more than a purely mercenary interest in their trade. One great advantage is the appeal that the book will make to the popular reader. It is entertaining, and is presented in a semi-technical style that does not tire. This is, perhaps, the result of the author's altruistic attitude. The healthy home to house a healthy body is held up as an ideal from first to last.

THE WIDTH AND ARRANGEMENT OF STREETS. A Study in Town Planning. By Charles Mulford Robinson. New York: The Engineering News Publishing Company. Price, $2. net.

This latest work of Mr. Robinson's is an interesting contribution to the literature on the subject of town planning. He states in his preface he had three sources of inspiration for the work: first, a study of some thirty towns and cities in the United States as to their special needs regarding the city plan; the second source was Harvard University, to the Department of Landscape Architecture of which the book is dedicated. The third source was a recent European trip and the international town planning conference in London.

The book should be full of valuable gestions to architects who are entering competitions for municipal or public b ings, designing monuments which sha of civic importance, or laying out resic parks and other civic improvements.

The chapters of the book cover the divisions of a street system; the stan izing of streets; width and housing; values; main traffic streets; the co street construction and the proper pla of streets to be in accordance with the quirements and not to exceed these rec ments in cost. The platting of streets, and public reservations other streets are also treated. The book tains many extremely instructive p graphic illustrations.

NOTES ON HEATING AND VENT TION. By John R. Allen, Pro of Mechanical Engineering, Univ of Michigan. Third Edition. Dor Engineering Company, Chicago, lishers. Price, $2.50.

Heating and Ventilation appears third edition which has been rewritten the addition of considerable new ma The book has been put in more des form for use as a college text-book, now an engineering treatise on heatin ventilation that should be of consid value to heating contractors and engi

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PRACTICAL SILO CONSTRUCTION A. A. Houghton. New York: The man W. Henley Publishing Con Price, 50 cents.

The methods of building a silo ir crete, both monolithic and cement bloc clearly explained by the author. He f discusses the silo built with cement on wire lath, reinforced rods. Dia fully explain the methods of constr employed.

METAL WORK AND ETCHING. B D. Adams. Popular Mechanics Co Chicago. Price, 25 cents.

This is another instructive little prepared at a popular price, which w doubtedly fascinate the novice in working. It is extensively illustrate photographs from actual work anc diagrammatic drawings.

(Continued on page 28.)

Art and Architecture

ARCHITECTURAL LEAGUE EXHIBITION

The 27th annual exhibition of the Architectural League of New York will open on January 28th in the galleries of the American Fine Arts Society at 215 West 57th Street, and continue until February 17th. Three illustrated lectures have been announced on "Practical Model Towns" by Grosvenor Atterbury; "Mural Painting" by Edwin H. Blashfield, and "Review of Recent Sculpture" by Augustus Lureman.

Some exhibits of special interest in the Vanderbilt Gallery are: Rollin Saltus' Gardens for Mr. Sloane at Mt. Kisco; Charles A. Platt's several large photos of country houses and gardens; Palmer and Hornbostel, competition drawing for North Western University; Hunt & Hunt, Belmont Chapel; Wilder & White, accepted design for Temple of Justice, Olympia, Washington; Green & Wicks, Toledo Museum, Toledo, Ohio; McKim, Mead & White, competition for Minneapolis Museum of Fine Arts; Donn Barber's Y. W. C. A.; Elliott Lynch, Buffalo Cathedral; Janssen & Abbott, House in Pittsburgh; Cram, Goodhue & Ferguson, Chapel of the Intercession; Clipston Sturgis, church; Kenneth M. Murchison's palace for the President of Cuba; Smith & Ross, sketch for studio; Walker & Gillette, Broadway Gardens; Grosvenor Atterbury, Phipps Clinic at John Hopkins' Hospital; Atterbury & Tompkins, house at Forest Hills; Albro & Lindeberg, Fox Hollow Farm. Middle gallery, south wall—Guy Lowell, Historical Society Building, and forty-five drawings from the Leon DeCloux collection loaned by the Cooper Institute.

In this collection breathes the atmosphere of paint and powder and frills and frippery of the period of Marie Antoinette. Yet, with it all, they show a mastery of design, and skill in rendering, and a sense of grace that charms us to-day, and is capable of being utilized in most modern up-to-date designs.

Mr. James Reily Gordon, Architect, announces the removal of his offices to 507 Fifth avenue, adjoining 42d street, New York City.

THE "LINCOLN MEMORIAL."

The Pennsylvania State Association of American Institute of Architects is acti pushing the cause of an appropriate : coln Memorial, and has issued the fol ing letter as an appeal to all Pennsylv legislators:

Dear Sir—At a recent meeting of Pennsylvania State Association of A tects the "Lincoln Memorial" was a ject of serious consideration, and Secretary was instructed to express to its concern regarding the proposed su tution of a Roadway for the original : of monument. The Pennsylvania State sociation affirms the opposition of all o subsidiary bodies, as it considers the P Highway proposition thoroughly inappr at as a memorial, and one that by its mercial and intangible nature would inadequately symbolize our Country's tion to the noble man we aim to h A dignified and monumental memorial already been approved unanimously an site definitely determined upon by ex of the highest ability and by men of petent judgment all over the country. believe that a memorial to Lincoln sl be in the nature of an offering or sac rather than a playground or speedway, has an entirely different object in vie

Hoping that the original propositio a memorial so capable of the highes pression and inspiration, as well as th portance of its unequaled location, also appeal to your good judgment meet with your endorsement, I beg t main, very respectfully yours,

WM. L. BAIL
Secret

Forest Products, Nos. 1, 5 and 7, pa lets issued by the Department of Com and Labor, Bureau of Census, deal "Wood Pulp Consumption," "Veneer" "Wood Distillation."

The Builders' Exchange Bulletin, pub by the Builders' Exchange of Balt Md., is an interesting publication wh devoted to matters of local interest. Exchange membership is an active on shows a well-organized condition o building trades of Baltimore.

The October and November issues of the Journal of the Association of Engineering Societies, which is published in Boston, contain several articles of particular interest. One on the "Water Resources of the State of New York" in the October issue, is instructive and valuable, as it offers an opportunity to manufacturers who are looking for factory sites where water is required. In the November issue there are two articles, "The Improvement of New Orleans Harbor" and "The Panama Canal." This last article deals with the significance of the canal in transportation problems, as well as describing the scope of the engineering work involved.

The Journal of the Western Society of Engineers contains in its October issue an article on "The Economic Construction of Storage Bins and Tressels in Cement Plants" by H. S. Marston. There are other articles of engineering interest. In the November issue an article on the Chicago River tunnels is of particular interest.

In the September issue of the American Society of Engineer ng Contractors, a paper on "A Simple Form for Cost Analysis" is of value. It gives a standard blank form for this purpose. The paper was a subject for considerable discussion before the Society.

Forest Service Circular No. 187, U. S. Department of Agriculture, treats of the manufacture and utilization of hickory, representing the conditions in 1911. Forest Bulletin No. 108, deals with the distinguishing characteristics of North American gum woods.

CIVIL SERVICE EXAMINATIONS.

Competitive examinations under the rules of the United States Civil Service Commission will soon be held throughout the United States. Full particulars may be procured by addressing the Commission at Washington, D. C., or the Secretary of the Bureau of Examiners at the postoffice in Boston, Mass.; Philadelphia, Pa.; Atlanta, Ga.; Cincinnati, O.; Chicago, Ill.; St. Paul, Minn.; Seattle, Wash.; San Francisco, Cal.; Customhouse, N. Y.; New Orleans, La. Old ..., St. Louis, Mo.

Fireproofing and Fire-Protection

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FROZEN SPRINKLER SYSTEMS.

The New York Fire Insurance Exchange has issued the following warning:

"To Owners, Superintendents and Tenants of Buildings Equipped with Automatic Sprinklers: Attention is called to the necessity for extra care of automatic sprinkler system during the approaching period of cold weather. The liability of water freezing in the pipes, valves, hydrants, tanks and other portions of the system requires special precautions, and a general examination of the entire system should be made, especially to ascertain what portions are exposed to low temperatures. This applies to the piping in any unheated part of the premises, but particularly doorways, driveways and other entrances, courts and areaways, halls, stairways elevators, dumbwaiters and other vertical openings, underground vaults, show windows, shipping rooms, attics, roof structures, skylights, etc. When it is not pr ticable to properly heat such places insulate the pipes, we urge the adopti of an approved dry pipe valve to cont the sprinklers in these sections, thus f nishing constant protection. If it is n essary to draw water from the expo piping in some minor section, a va should be provided to control these sectio and these valves must be properly tag exhibiting in plain letters the directio 'Shut—Open in case of fire.'

"Where approval has been granted convert a wet pipe system, or part of into a dry pipe system during the win months, it is required that such syst be placed under air pressure. The wa should be drawn off, the piping thoroug drained, the dry pipe valve thoroug cleaned and put in proper working or and where necessary, protected from fre ing On the completion of the chan this office should be notified. Attent should also be given to maintaining outside steamer connection of the eq ment in proper order with caps on free from rust, ready for use by the department in case of need. If you h any difficulty in maintaining the sys in full working order, please inform us

(Continued on page 24.)

once, and we may be able to recomm some remedy for the trouble."

During the recent cold weather, sev cases have come to our notice of fr sprinkler systems, and this warning sh be of particular interest to building ow It serves a further purpose, however which architects in particular should heed. When a sprinkler system is pa the original construction of the buil the architect should familiarize hi with the conditions of sprinkler installa and see to it that the system is so inst that there is no likelihood of the sy being rendered inoperative through f ing conditions.

THE EQUITABLE FIRE.

The burning of the New York Equi Life Assurance Building, which occurr January 9th, has destroyed a land that has been one of the first poin interest in New York since the erecti the building in 1868. In constructio building was obsolete, and to use a mon phrase, was a "candidate for the heap." The attitude of the officers o Equitable bears this out, for no insu was carried on the building, and i statement of valuation of the compan lot alone was appraised and the bu itself was not figured. In constructio building contained some steel work, a portion was fireproofed with tile, b flanges of the floor beams were ex The large amount of woodwork en into its construction offered the fuel f quick and vigorous fire that occurre destruction was inevitable, but poin particular lesson, as methods of fir vention and fireproofing have advan greatly since the erection of this b that it could not have been rated i sense as a modern fireproof building

The large amount of valuable r which were stored in the building, offices and vaults, together with th mendous amounts of securities rat high as two billion dollars add a spe lar feature to the fire. However, work of recovery of property progress losses are found to be less than firs mated. The vaults, which are of m less modern construction, withstood fects of the high temperatures, and

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contents are all preserved. The loss of in connection with the fire is the most grettable circumstance.

A fire occurred in the Chicago Boar Trade Building on January 10th which at first reported to have entirely destr the building. Later reports, however, s that the blaze was promptly brought u control, and the damage was slight.

Below our illustrations of the Bon Teller building in the December issu was mentioned that the sprinkler equip was installed by the Rockwood Spri Company. The source of our inform was inaccurate, however, as the equip in the building was installed by the Ge Fire Extinguisher Company.

The Quarterly of the National Fire tection Association for January 1912 tains a "Syllabus of public instructi Fire-Prevention." This syllabus is of ticular advantage to teachers, and s be in the hands of every teacher i United States. Many other subjects interest are comprised in the contents quarterly.

The collapse of the brick walls su ing a newly installed sprinkler tank factory of the R. J. Ederer Thread Co at Frankfort, Pa., requires special i gation. This 15,000-gallon tank was e upon the old building, apparently w an adequate investigation of the b capac.ty of the walls. So far as w learned, no architect was consulted gard to the construction, and the bla the accident seems to fall largely up inspectors of the Building Depa This is merely another case that po the necessity of proper supervisio guidance in construction work. An

(Continued on page 28.)

tect should have been employed, and the architect should have been thoroughly familiar with the requirements for and the equipment of a sprinkler system.

According to the Journal of Commerce and Commercial Bulletin, the loss by fire in the United States and Canada during the year 1911 amounted to $234,377,250. This loss is but $100,000 less than that of the previous year. The schedule given in the Journal of Commerce of January 2, 1912, shows that the fire loss of the last 35 years amounts to over five billions of dollars in the United States and Canada. The average is about $148,000,000 a year. Let us hope that 1912 will show a better record, and that the organized campaign against fire waste which is being carried on by different organizations and publications may be productive of greater results during 1912.

The New York building code which has been a subject for active discussion by New York architects and builders for the last year, was defeated at the last session of the board of aldermen. It is the hope of the majority that this ordinance has appeared for the last time and with the new board of aldermen, which is now in office with a Republican and Fusion majority, a complete and practical building code, scientifically compiled,may reasonably be hoped for. If such a code is not passed in this session, it will not be because of insufficient effort on the part of honestly interested persons.

HANDBOOK FOR ARCHITECTS A: BUILDERS. Emery Stanford Hall, e tor. Published under the auspices the Chicago Architects' Business As ciation. Vol. 19. Price, $2.20, expı paid.

The 1911 edition of the Handbook Architects and Builders is of increasing terest. The building ordinance is that pa ed by the City Council of Chicago on cember 5, 1910, effective on January 1911, and besides this ordinance there many special suggestions for wiring; fitting; hollow-tile fireproofing; measu ments for excavations in concrete wo specifications for structural steel in bu ings; strength of materials; heating ventilating; preservation of wood by pa ing; measurement of plaster; specificat for cement; glass and glazing; and m tables of strengths of materials shov the ultimate working strengths of diffe materials. A short architectural cha deals with the orders and their applicat and contains detail drawings giving the portions. The book is thoroughly inde and contains a list of classified adverti and material men.

THE CONTRACTORS' AND BUILDE HANDBOOK. By William Arthur. York. The David Williams Comp Price, $2.

This may be considered in many resp a business guide for the building cont tor. The volume is divided into three bo one dealing with the contractor as a l ness man, the second with the contra as a constructor, and the third with contractor as a taxpayer. The first deals with the contractor's business tions with the various parties he is ap meet in his operations, and goes on to advice as to methods of conducting ness, office and building force, insura bonds, etc. The second portion is, sense, an essay on good construction the subject of design left out, how This Mr. Arthur leaves to the arch The third book is devoted to general jects which are of special interest to building fraternity. The author expr personal opinions to some extent thro out the text of the book, and gives ı data collected from various sources.

Industrial Progress

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An announcement has been made by the authorities of the Panama-Pacific International Exposition, which will be held in San Francisco in 1915, that McKim, Mead and White, Henry Bacon and Thomas Hastings of New York and L. C Mullgerdt and George W. Kelham of San Francisco will assist the members of the Architectural Commission, consisting of Messrs. Willis Polk, William A. Faville and Clarence R. Ward in planning the great International Exposition.

(Continued on page 32.)

The report relating to the registration of births, marriages and deaths for the Province of Ontario for the year 1909 is interesting and instructive. The method of compilation, which is entirely tabular, is commendable and offers a good model for reports of similar character.

In "Sanitary Pottery" the house organ of the Trenton Potteries Company, there appears as a centerpiece an appeal and an offer of assistance to the local plumber to better his standard of advertising. We admire the activity of the Trenton Potteries Company, and believe that their efforts are worthy of emulation by other manufacturing concerns who sell to the trades.

ORNAMENTAL PLASTERING.

Two of the most popular and yet plastic forms of interior decoration are plaster and Kean cement and through the use of these materials many beautiful effects have been obtained, but great as is the credit due the plasterer, still much greater credit is due the sculptor who prepares the preliminary models and ornamental forms.

Among the names of sculptors whose medium is the preparation of molds for architectural plastering, the name of Dominick A. Walsh of Belleville, N. J., occupies a high place.

The ornate plaster effects to be found in many of our most important structures throughout the length and breadth of the country owe their existence to the preliminary models prepared by this artist.

Among some of the important residences and public buildings for which Mr. Walsh prepared the plaster models might be mentioned the following:

Residence of L. Z. Leiter, Washington, D. C.; Raleigh Hotel, Washington, D. C.; Postoffice, Washington, D. C.; Equitable Building, Baltimore, Md.; San Francisco Postoffice and Custom House; St. Cecilia's Church, Englewood, N. J.; St. Joseph's, Plainfield, N. J.; Our Lady of the Valley, Orange, N. J.; the exterior models for the Sacred Heart Cathedral, Newark, N. J., and Miner's Theatre, Newark. Mr. Walsh is now engaged in the preparation of the models for the interior of the new Essex County Bank Building, which institution will rank among some of the finest examples of architecture to be found in this country.

Persons interested in obtaining attractive designs and models for high grade plaster work will do well to consult Mr. Walsh at his office, 358 Cortland street, Belleville, N. J.

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Numerous tables for beams, columns, girders, etc., are given, also many diagrams.

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ARCHITECTURE AND BUILDING

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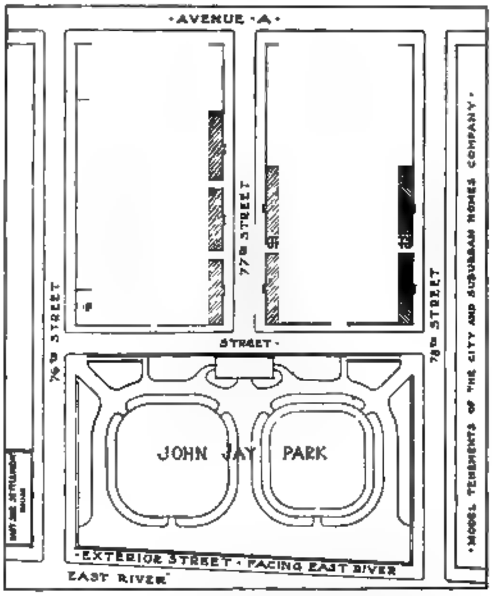
THE PASSING OF THE INTERIOR TENEMENT STAIR

By CHARLES WARREN HASTINGS.

STAIRWAY planning is one of the most important items in any building, and an intelligent treatment may add greatly to the utilty of the building. Since the earliest history of tenement houses, the dark, narrow and closed stairways usual to such buildings have been one of the tenement's most objectionable features, but for years the world has gone on building tenements in much the same way, often attempting improvements in other directions, but seldom in the stairways. The first recorded attempt to build stairways which should be free from objectionable characteristics was made in 1878—the Monroe Tenements on Monroe Street, Manhattan, and tenements erected by Alfred J. White on Columbus Street, Brooklyn. Neither of these attempts proved successful, and several important objections are apparent from the plans. The common hallways were dirt and filth collectors, unlighted and unventilated, and in case of fire in the front apartments it was impossible for the other tenants to get past the burning rooms to the common hallway.

The Vanderbilt Tenements are the result of Mrs. W. K. Vanderbilt's study of tuberculosis among the very poor. Sunlight and fresh air—the two most important requisites in the cure of this disease, are usually lacking in the average tenement, and when Mrs. Vanderbilt decided to build a group of tenements in which these two elements should be present, the open-air type seemed to offer a satisfactory solution to the problem. The site selected for the tenements—78th Street east of Avenue A—has several important advantages. It is on high ground, and in the neighborhood of a University settlement where much sociological work is being done. The city of New York has built a public school and a public bath in this section, and the John Jay Park is under way.

The Vanderbilt Tenements possess all

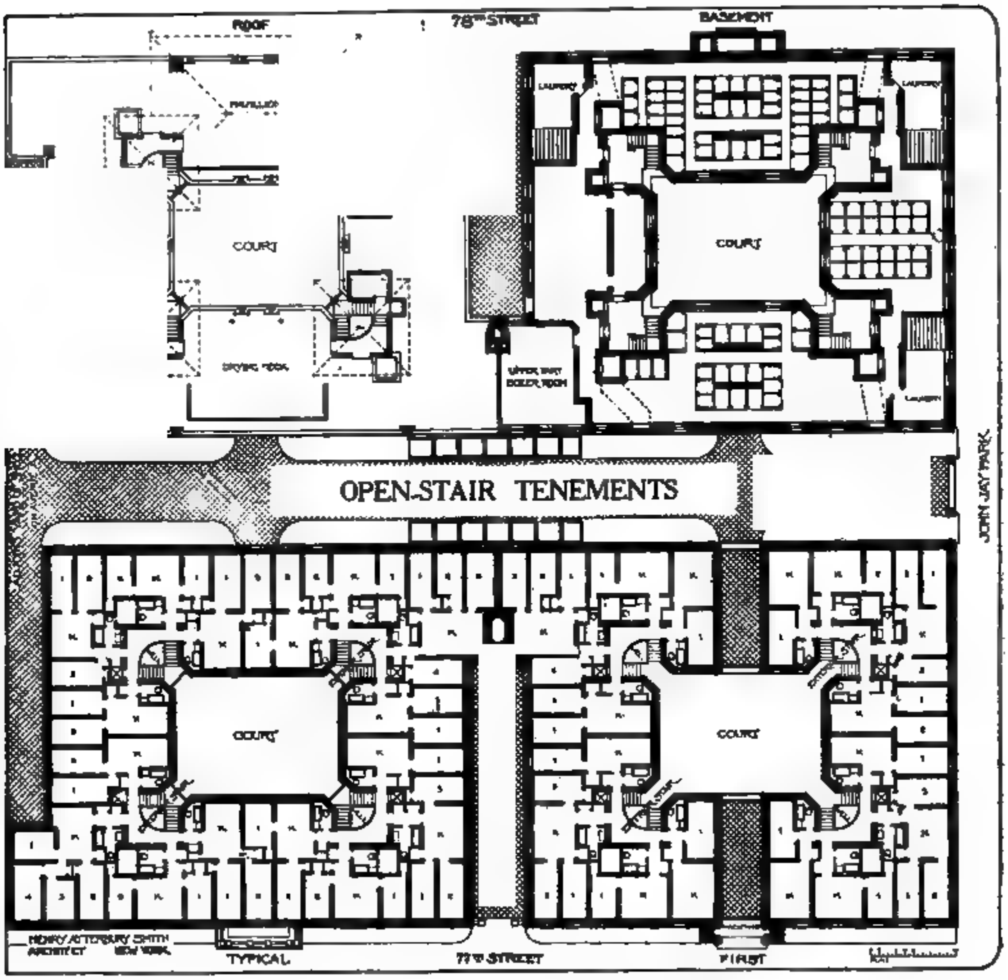


THE SITE OF THE OPEN-STAIR TENEMENTS.

the advantages usual in model tenements, such as garbage closets, ample light-courts, etc.; but the radical improvement in their construction is embodied in the open stairways, of which there are four in each building, a flight starting from each corner of the main court of each building and ascending to the roof. These stairways, being open to the air on all four sides, give off no noisome odors because of the currents of fresh, outside air constantly passing through them; filth and litter are too readily seen to accumulate; fire escapes are rendered unnecessary, for there can be no better fire escape than the open stairway itself. In the event of fire, each occupant can go out upon the balcony in front of his own door, which, being a fireproof, self-closing door, automatically closes, thus preventing any possibility of flames shooting up the stairway. The danger of suffoca-

THE MONROE, BUILT IN 1878.

PLAN OF THE MONROE.



PLANS OF THE OPEN-STAIR TENEMENTS.
Henry Atterbury Smith, Architect.
Wm. P. Miller, Associate.

tion by smoke is entirely obviated, because no matter how dense the volume of smoke may be, the animated current of air will carry it aloft and dissipate it, removing even the danger of stupor. The stairways, being open on all sides and in clear view of the watchmen or police, cannot be used for the immoral purposes for which the enclosed stairs of tenements are so often employed. The use of the open stairways gives an increased area of 12 square feet which may be added to the room space in each apartment. The stairs are protected from the weather by wired glass at the top, insuring safe and comfortable access to and from the street in inclement weather. There are no elevators, and in order that the climbing of the stairs may not be unduly tiresome, benches are provided as resting places on each landing.

The roofs of the Vanderbilt Tenements, which command an excellent view of the East River and Long Island and afford on clear days at all seasons, an ideal resting place in the open air for tubercular patients, have been made as attractive and comfortable as possible,

THE OPEN-STAIR IN THE COURT.
Henry Atterbury Smith, Architect.
Wm. P. Miller, Associate.

AN ENTRANCE FROM THE STREET.
Carpentry: W. E. Smith, Inc.
Fireproof Doors and Windows: Knoburn Co.

THE OPEN-STAIR TENEMENTS, FACING THE SITE OF JOHN JAY PARK.

Builders: Jacobs and Young.
Flat Tile Roof: John Laura & Co.
Stanley Butts Used.
Marbleloid Flooring.
Painting: Charles Grimmer & Son.
Carpentry: W. E. Smith, Inc.
Front Brick: Harbison-Walker Refractories Co.
Copper Cornices and Skylights: Architectural Metal Works.

Henry Atterbury Smith, Architect.
Wm. P. Miller, Associate.

DETAILS OF THE ROOF, SHOWING THE SHELTERS OVER THE STAIRWAYS AND THE PAVEMENT OF TILE ADAPTING THE ROOF FOR A RECREATION GROUND.

Flat Tile Roof: John Laura & Co.
Carpentry: W. E. Smith, Inc.
Copper Cornices and Skylights. Architectural Metal Works.

Henry Atterbury Smith, Architect.
Wm. P. Miller, Associate.

THE ADMINISTRATION ROOM IN THE OPEN-STAIR TENEMENTS. MARBLELOID FLOORING LAID WITH A SANITARY BASE.

and are provided with shelters with glass protection to the north. The window balconies serve a similar purpose—they are not fire escapes, but are for the purpose of out-door living. The windows are triple hung and open down to the floor.

The buildings are six stories high, entirely fireproof in construction, and contain suites of two, three, four and five rooms, each suite having its separate complete bath of three fixtures—basin, tub and toilet. These toilets are vented upon the stair wells of the open stairs, and also into narrow vent shafts about 2 by 4 feet in cross sectional area.

In the basement are public laundries and steam-driers. although wash tubs are also provided in each suite. There are also locker rooms for baby carriages and bicycles, accessible to the street by means of an inclined runway. The boiler plant, which is centrally located under the court, is of such a capacity that in addition to the heating, electric light may be supplied to the tenants at no extra cost. Hot water is provided, and the kitchens are equipped with gas ranges. The rooms are of monolithic fireproof construction, the floor surface being turned up several inches into the walls, with a sanitary face, thus eliminating all cracks and corners at the junction of floor and wall. This flooring is a composition known as Marbleloid and about 300,000 sq. ft. have been laid in the four buildings.

The cost of these buildings was $1,250,000, and while philanthropic in their original conception, they have proved to be so entirely practical in their operation, that a company has been formed to build a similar group in 178th Street as a practical investment venture. Several other like projects have also been started.

The builders of the tenements were Jacobs and Young. The carpentry work was done by W. E. Smith, Inc. John Laura & Co. laid the flat tile roof and the Architectural Metal Works did the copper cornices and skylights.

THE FIRST "TEXTURE-TILE" HOUSE

IF for no other reason, the house which these pictures show would be interesting because it is the pioneer "Texture-Tile" house. In explanation of the unusual form of the house, it may be well to say that it is built on a hill, and on the side opposite its approach, circles a panoramic view with an horizon fifteen miles distant. The house was curved in plan so that every room would command this view. The roofing of the house is an attempt to reflect the outline of the hill in the building itself. A bungalow type was the owner's preference. In so far as this article is concerned, it is the structural aspect of the building which will be considered, and its design will be studied only in its bearing on the use of "Texture-Tile."

This house, which is the country home of Mr. Horace Lyon, at Englewood, N. J., was designed originally with 8-inch terra-cotta walls above grade, which were to be stuccoed, and the cost of the entire structure figured twenty cents a cubic foot. A 10-inch wall of "Texture-Tile" facing and stock tile backing was substituted at no additional cost over the 8-inch wall with stucco. In other words, this contractor figured a 10-inch "Texture-Tile" wall to cost the same as an 8-inch stock tile wall stuccoed.

In another building, now under way, which was originally designed in frame, an interesting comparison of costs ob-

The Pyne House, designed by McKim, Mead & White. In this, originated the idea of "Texture-Tile."

THE HOUSE FROM THIS SIDE COMMANDS A PANORAMIC VIEW WITH A 15-MILE RADIUS.

tains. The same contractor who figured the job in frame is now building it in "Texture-Tile" at an advance of only 3 per cent. over his frame proposal. So much for costs.

All the drawings were laid out to exact tile dimensions, both horizontally and vertically, so that no "Texture-Tile" were cut. The two lowest courses were laid dry all around the building before any work was begun. This kind of planning resulted in a very accurate and rapid piece of work. Three sizes of "Texture-Tile" were used—the stretcher, the half-stretcher, and the corner block. The last was an L-shaped block showing a stretcher length on one side and a half-stretcher on the other, which has since been abandoned in favor of a simpler rectangular corner block like a brick and of such length that it reaches from the corner to the center of the first regular tile above it.

In this instance the "Texture-Tile" was made from a Jersey clay, the rough surface being obtained by mixing broken tile with the clay before it was fired. More successful is the use of shales such as those from which the western and Pennsylvania rough brick are made. The writer sees no reason why the lighter colors seen so often in the western clays may not be the most successful and find use in the most dignified buildings. School buildings, hospitals, hotels, and other small public buildings, the stuccoing of

THE WINGS ARE TURNED TO THE VIEW.

which combats a popular prejudice, could be cheaply and effectively executed in "Texture-Tile," which allows a unit of damental fireproof qualities without being limited to stucco covering. To those architects who do not favor the use of stucco, "Texture-Tile" should remove the last objection to the use of hollow terra-cotta tile as a fireproof material for the walls of buildings.

It is also interesting to note that it is always possible to make brick at the same time and from the same clay as "Texture-Tile," which allows a unit of new size for use in the design with no unpleasant variation in color or texture.

As is to be expected in a pioneer, there are defects in this first house. The corner blocks were fired twice because the first firing did not burn them dark enough. The second firing burned them too dark. Where there are small piers, these dark corners stripe the piers too much. There is a trifle too much variation in the colors of nearby tile which even the rough-surfaced neutral-colored joint does not entirely overcome. But all things considered, the result is highly successful. The artistic test is the answer to the question as to whether or not one would stucco the building. To this, for all who have seen it, the answer of architects and laymen alike is an emphatic "no."

The greatest charm of the wall is its lovely color. When seen at a slight angle it looks like a rare old oriental rug. It has infinite variety. The *ensemble* is

Compare the Texture of the new Block with the old.

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read the previous articles is directed to the revival of taste toward good brick work. Long ago, brick making and brick laying were among the fine arts. It is getting to be so again. In the old and the new brick art, the beauty is dependent on the texture of color and surface, just as it is in fabrics. Color texture is the *ensemble* resulting from the combination of small units, each varying in a small degree from its neighbor. The general tone produced is a blend of each, but always with the interest of the contrasts. Surface texture is a thing of shadows. It is the play of light and shade on the roughened surface of the units and on the dividing joints between them. It is enhanced if the diverging

Notice the Velvet Look of the Wall.

The Shingle as a large unit.

lines make up a pattern. Good modern illustrations of this subject of texture are the Lotos Club, the Madison Square Presbyterian Church and the Brooklyn Academy of Music. It is illustrated in another medium in the big waiting room of the Pennsylvania Station. Here Travertine marble was the material used, which has a color texture of its own, and the surface is full of tiny crevices which give a decided interest to the general result. These principles have been applied to "Texture-Tile." In many cases there is a decided change in color in the unit itself. Where it is hard to get enough variation in color in brick, it is easy to get too much in tile.

The size of the "Texture-Tile" unit is the most obvious departure from usual standards. Yet is not this large scale the very thing that is striven for in the country house? The house here illustrated has its shingles laid 10 inches to the weather. It is uniformly successful practice to use extra wide clapboards. In stone work, so much of the charm lies in the big unit that it is difficult to say when the limit of size has been reached. Even in brick the constant tendency is to make them larger, not higher possibly, but certainly longer. As to the economy of the large unit, there is no chance for argument. A mason can lay a "Texture-Tile" block in the same time it would take him to lay a brick. The costs of the houses here mentioned furnish ample proof of the economy of labor in the laying of a large block.

In the following article, details of this "Texture-Tile" bungalow will be shown by photographs, and its construction will be illustrated by the working drawings from which it was built. "Texture-Tile" has great possibilities, of this the author is convinced, and that he has the courage of these convictions is shown by the Lyon house, for a house set on a hill cannot be hid.

(To be continued.)

SWISS CHALET DESIGN

ARTICLE IV.

By WM S. B. DANA, B. S.

THE anatomy of the châlet husk having been carefully studied in the previous articles, it would seem that an investigation of its facial characteristics might well claim our attention at this point.

The châlet face—or façade—is the universal façade. Its *sine qua non* is a square—a square sheet of wood or other material, in upright position, as in Fig. 23. The two encircling frames at

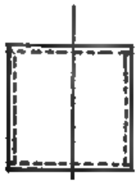


Fig. 23.

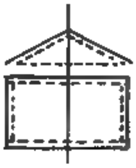


Fig. 24.

top and bottom are indicated, each announcing the front edge of a floor; the axis of symmetry is also given. But another element of equal importance in its effect on the design of the châlet façade is the outside "ridged floor" (roof) whose front edge, instead of being a continuous member, as in the girt frame, is raised at its middle point to form the two sloping sides of a shallow isosceles triangle, as in Fig. 24. The protective effect of these outer sloping surfaces on the exposed wall faces, alike from storm and sunlight, when they are made to extend outward in wide brims, has already been set forth; its effect on the design is that of a broad, generous hat brim, shading an attractive face.

The essential features in the design of the façade, then, are as indicated in Fig. 24. The surface between sill and roof may be increased by the addition of one or more stories, or carried below the sill in masonry to the ground.

The texture of the wall surface is that given by tiers of horizontal beams of a deep glowing tan color, with their upper edge beveled to shed off the weather.

A point of the greatest importance in the design of the façade is, naturally, that of the openings and their disposition. As the question of châlet wall penetrations is subject to the universal law which governs in all façades, a graphical representation in the form of a diagram is given in Fig. 25, in which the evolution from a blank wall to one with many perforations is shown. The large square is divided into four smaller squares, and these again subdivided into four equal squares. In the first group, 1, 2, 3, 4, the central treatment is indicated, in which a single window or group of windows is centered on the axis of symmetry. In the second

Fig. 25

group, 5, 6, 7, 8, the double treatment is indicated, in which the space on either side of the axis is occupied by an opening. The next division is a combination of triple, quadruple and quintuple treat-

Swan House, Lucerne.

DETAILS OF HOUSE AT GOLDEREN.

From Graffenried et Stürler.

CHALET GIRAUD AT VARESE.
Parquet & Châlet Fabrik, Interlaken.

CHALET MATTI AT INTERLAKEN.
Parquet & Châlet Fabrik, Interlaken.

ment, while the last shows the application of the foregoing to superimposed stories.

The swan houses at Lucerne are submitted as an example of the simplest case, No. 2. In the house at Golderen, examples of 3, 4 and 8 are to be seen.

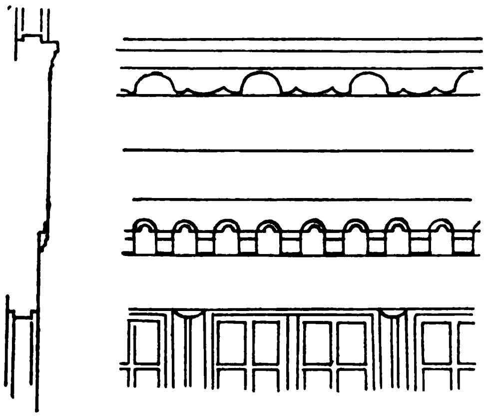


Fig. 26.

Châlet Giraud, on page 59, contains window groupings belonging approximately to 5 and 7. The façade of the Châlet Matti at Interlaken, which faces up the valley of the Jungfrau, made famous in Heine's poem of the Lorelei, has in each story a different grouping, the bottom being the quadruple treatment, the first story containing two groups of double windows each, the next story having a triple treatment, with a double window in the middle and a single on either side, while the roof story has the usual double treatment of small single windows. The Châlet at Grilly shows a still greater complexity of groupings, beginning with the double treatment in the main story, with a quintuple group on the right; the next floor shows a variation of 7; above this is a triple treatment with a quadruple group in the centre and a single small opening on either side. Practically all the windows show wooden shutters composed simply of two boards cleated at top and bottom and perforated near the top by a single lozenge—or heart-shaped opening. They are colored a bright green, though a light buff is coming greatly into favor. In the example at Golderen, vertical and horizontal shutters with exterior runways are shown. The window sash are casement, as a rule, opening in. A sparkling effect is given them by dividing the upper portion into small squares of glass by sash bars. At Golderen, again, the round pane effect is gotten by means of "bulls'-eyes." The window frame, or casing, is frequently very similar to that of the American frame house, though with the uprights passing beyond the cross-pieces.

Over and about the "frame-work" of the façade—its vertical corners, story boundaries, gable portion, and window and floor frames—is spread a mesh of ornament, composed of strips and bands and ribbons of "wooden lace"—broad bands, as in the case of the older and more classic examples, filling the entire space between the successive rows of windows; similar bands, but with the middle portion plain and with the decoration applied only to the top and bottom (corresponding to the window sill and floor) edges, as in Fig. 26; or only the

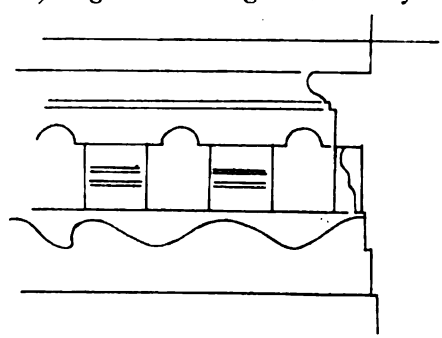
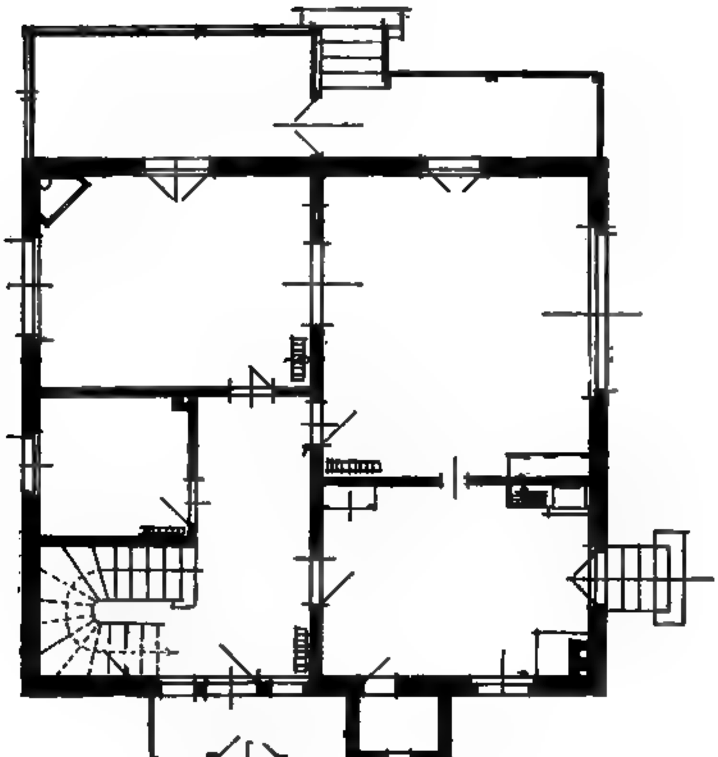


Fig. 27. Tablette de fenêtre. Diemtigen.

upper edge may be decorated, as in the example at Diemtigen, Fig. 27. Other broad bands (horizontal) of ornament are the balcony balustrades, and, in a slighter degree and much less frequently, a narrow strip of roof. Fig. 28 shows a frieze at Iseltwald bounded top and bottom by mouldings, and with ornament



CHALET STEINMANN AT GRILLY.
Spring Frères, Mfrs., Geneva.

Fig. 28.

in the upper half. Below this is another characteristic horizontal feature, a text, in German. Other horizontal strips, or courses, of ornament are to be seen in the accompanying illustrations, especially the rows of moulded beam-ends; the many groups of narrow, horizontal "ribbons" of shade and shadow caused by the grooves or bevels of the wall-beam edges are an appreciable element in the decoration. Window boxes and shelves, window and door sills and hoods, and also, often, long groups of windows, are important horizontal features. Rows of brilliantly colored flowering plants and gaily striped awnings add a life and joyousness to many châlets, especially among the more modern. The vertical strips of ornament are necessarily less in number and of no great width. They consist of rows of superimposed beam-ends, with their joints beveled and their edges scooped; also of window muntins and shutters.

The ornamentation and decoration, then, of the châlet façade, next to the color and texture of the wood (or masonry) itself, is found to be dependent upon horizontal and vertical surfaces projecting or receding, organized, in some cases, into a broad belt of light and shade harmony; in others, as delicate ribbons of lace-work. That is, its groundwork is the moulding, to which is applied the arrangement of "knobs" of equal size, placed in rows, with equal-sized "voids" between; the "knobs" may be anything in shape from the heart, lozenge, or star-shape, to the dentil and modillion, in a multitude of varying forms; the void, too, may be complete, or it may serve as a more or less defined link between adjacent "knobs," or projections. In the two examples of flat ornament in Fig. 28, examples of this alternation of projection and void may be seen in the undulating curve of the scroll and the alternating rosettes and coves in the upper example. The same condition is to be seen in Fig. 27 in the wavy curve at the bottom; just above this curve is a row in which the knobs are moulded dentils of equal size, separated by equal rectangular voids. In the course above this the voids are semicircular. The ornament over the windows in Fig. 26 closely resembles this latter; the strip at the top resembles that in Fig. 28. In the examples of châlets, which are given, as in the Châlet Matti and in Figure 27, the ornament can plainly be referred to these two classes. In the succeeding number it is planned to make a careful study of châlet interiors and planning.

(To be continued.)

FIRE PROTECTION OF THE DWELLING HOUSE

WHEN building a new house, the idea is becoming more and more popular to build one that is, to some extent at least, resistive to fire. Where but a few years ago a fireproof dwelling was considered a hobby and also to some extent scoffed at by the majority of home builders, it is becoming a more popular idea at present, with the increasing outcry against the great national fire loss. The suburban populations and the dwellers in our smaller communities are the national home builders. The great majority of suburban houses are of frame construction, and it is the aim of this article to point out how, by simple means and at relatively small expense, the frame building as it now stands may be made less susceptible to total destruction by fire.

We will first consider the frame house from the standpoint of external hazard. The average frame house, even when built on a liberal sized lot, stands a slim chance in a general conflagration. This has been proved in more than one great fire. Witness the Chèlsea fire, and that one of more recent date in Bangor, Me., where the flames swept great districts, spreading from roof to roof, the fire brand to the shingle just as the spark to tinder.

How can our present dwellings be protected? When the shingled roof needs repair, it would be better to remove it. It may be replaced with slate, with asbestos tile, with metal shingles, or with tin. The additional expense varies in amount with the material chosen, but the safety derived from a non-combustible roof should many times repay the householder for his additional outlay. The campaign against the shingled roof has already produced some results. At least one community in revising its building laws has forbidden the use of shingles on new buildings and has provided in the case of repair and alteration work, that if more than 50 per cent. of a shingled roof is disturbed, all shall be removed and replaced with a non-combustible roof.

We may make a further recommendation for protection against external hazard. If alterations or repairs to the exterior of a house are contemplated, the most pleasing effects may be obtained by over-coating frame houses with stucco. This can be done right over the present structure with wire lath fastened on furring strips to support the stucco coating. Stucco is susceptible to a variety of treatments, in both color and texture, and its original cost would be equaled in time by the expense of repeated painting of the woodwork. This stucco shell, together with a non-combustible roof, offers a splendid safeguard for the dwelling against external fire hazard.

We will now turn to the protection of the dwelling against fire within. Property owners are seldom remiss in protecting themselves against fire to the extent of an insurance policy. Incidentally, such remuneration never fully covers the loss. The time spent in rebuilding alone represents a considerable amount in money, and the building invariably costs more to replace than did the original structure. Once insured, little thought is ever given by the average man to protection against fire until the premium comes due again. Every house owner could afford to spend

a little spare time in the consideration of ways and means to protect his dwelling from destruction in the case of an internal fire. If means are at hand within the dwelling to attack the fire at its inception, this is usually the end of the blaze. If it is not controlled until the local fire department arrives, the loss is generally considerable, if not complete.

As an example of what may be done to protect the home against fire, we will describe the equipment of the residence of Mr. Frederick D. Parsons in Springfield, Mass.

(1) Grinnell automatic sprinklers in cellar, protecting all parts of the basement.
(2) Automatic fire alarm in basement and kitchen, with Watkins thermostats connected to alarm gong on second floor.
(3) Standpipe with 120 pounds pressure (Little River water) extending to top of house through rear hallway, with 50 feet of linen fire hose attached to standpipe in first, second and third stories.
(4) One Knight & Thomas 3-gallon chemical extinguisher in second story.
(5) Three filled water pails, marked "For Fire Only," on a shelf in the cellarway.
(6) Fire axe and lantern hung in a convenient place.
(7) Brick and mortar fire-stops at each floor in all main partitions.
(8) Full-size wire fire screens over all fireplaces that are used.
(9) All matches kept in a covered metal box marked "Matches."
(10) Only metal barrels used for ashes.
(11) One large metal barrel with cover, marked "For Waste Paper Only."
(12) Cellar kept clean all the time.

Note I.—Given above equipment, or a major part of it (put in at a moderate expense), in every dwelling and mercantile building, and the fire waste of the country would be lessened immediately at least 50 per cent. Note II.—Notwithstanding that the foregoing protection is superior to that of most dwellings, there are still plenty of chances for loss, and fire insurance very near to the full value is carried on both the building and its contents.

This is an ideal equipment which will seldom be duplicated in a private house; but it serves as an example of what may be done if the spirit is willing. Most house owners will probably have recourse to a larger use of chemical extinguishers. One portable extinguisher on every floor in a handy place is an excellent precaution. In the cellar or the stable, a fire bucket tank is an excellent provision and is much more apt to be ready for service than the open, standing fire pails which may be dry at the critical moment.

Structural improvements may also be made in the dwelling, often affording advantages other than those of fire protection. Deadening and insulation between the floors and within the walls may be accomplished by such substances as mineral wool and insulating quilt. Such a filling is a good fire-stop in itself, and also adds to the warmth and tightness of the dwelling. One cause of the spread of fire is the open construction where the studding joins the sill course about the foundations of the house. A look about the cellar ceiling, as this is often left of open construction, will show an opening between the first floor beams directly up within the outside walls between the sheathing and the plastering within. This forms a natural flue that in case of fire in the cellar is a quick and certain means of spreading the blaze throughout the house. A brick and mortar fire-stop, built in at this point, is most advisable and may be cheaply done without tearing away partitions, or causing additional expense more than for the material and labor alone. If the attic is open, further remedies may be applied with little trouble there. A look about the sides will show the top of the opening which has been referred to in the cellar. This may be stuffed with mineral wool, rammed as far down as possible, and if the owner is inclined, an application of brick and mortar is a further safeguard here.

Ordinary precaution against the accumulation of litter and waste is perhaps the best safeguard of all. Cleanliness, they say, is next to Godliness; but for fire prevention it is the best insurance policy.

THE APARTMENT HOUSE

APARTMENTS 521-523 WEST 112TH STREET, NEW YORK.

Builders: Theodore Starrett Company. Lawlor & Haase, Architects.
Tapestry Brick: Fiske & Co., Inc.

APARTMENT 523 WEST 112TH STREET, NEW YORK.

Lawlor & Haase, Architects.

Builders: Theodore Starrett Company
Tapestry Brick: Fiske & Co., Inc.
Flushovalves Used.
Panel Boards: Metropolitan Electric Mfg Co

THE RUNOIA, 267 WEST 89TH STREET, NEW YORK.

Front Brick: Harbison-Walker Refractories Co.
Flushovalves Used.
Lighting Fixtures; Black & Boyd Mfg. Co.

Mulliken & Moeller, Architects.
Metal Covered Windows: Howell, Field & Goddard

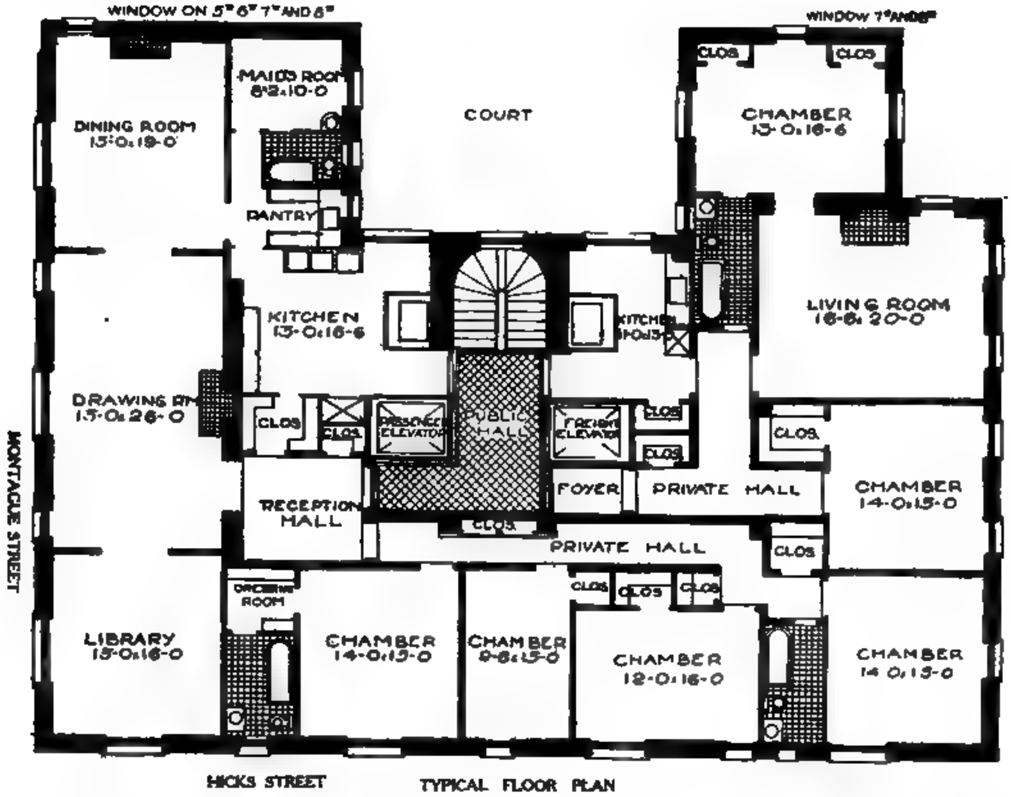
NUMBER 829 PARK AVENUE, NEW YORK.
Pickering & Walker, Architects.

Plan of 823 Park Avenue.

NUMBER 823-829 PARK AVENUE, NEW YORK.

Pickering & Walker, Architects.

Heating and Ventilating: Boyd Equipment Co.
A. B. See Electric Elevators.
Star Expansion Bolts Used.
Metal Covered Windows: Howell, Field & Goddard.



THE CASINO APARTMENTS, MONTAGUE AND HICKS STREETS, BROOKLYN, N. Y.

Keystone Flat Finish. **Wm. A. Boring, Architect.**
Floors: Indiana Flooring Co.

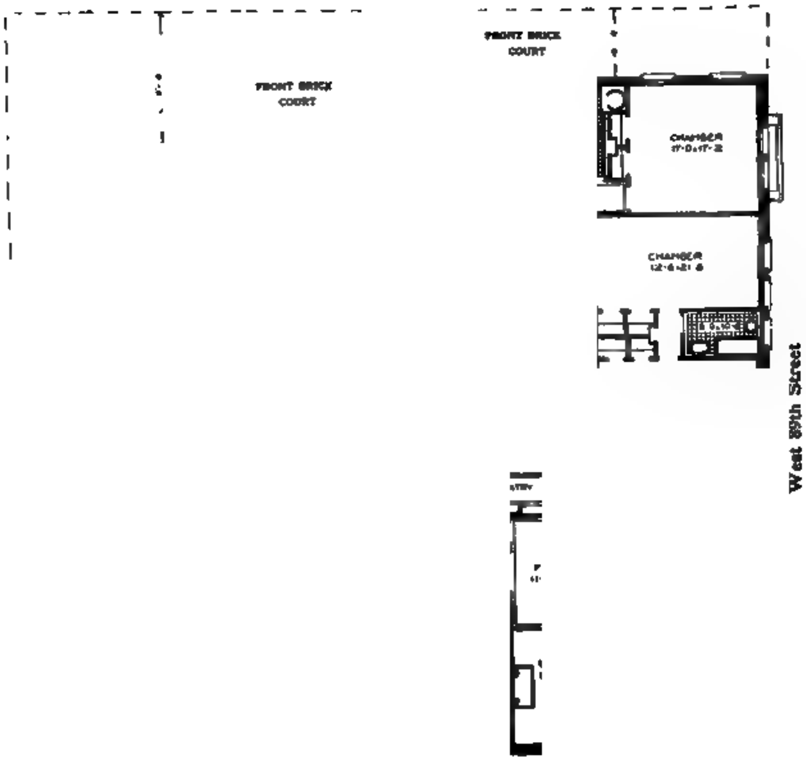
THE CASINO APARTMENTS, MONTAGUE AND HICKS STREETS, BROOKLYN, N Y.

Wm. A. Boring, Architect.

20th Century Fire Hose Cabinet: John Simmons Co.

NUMBER 600 WEST END AVENUE, NEW YORK.
Lighting Fixtures: Black & Boyd Mfg. Co. Schwartz & Gross, Architects.

THE ALLENDALE, 99TH STREET AND WEST END AVENUE, NEW YORK.
Decorations and Furnishings: H. F. Huber & Co. Rouse & Goldstone, Architects.
Interior Marble: Cork & Zicha Marble Co.



NUMBER 600 WEST END AVENUE, N. E. CORNER OF 89TH STREET, NEW YORK.

Schwartz, Gross & B. N. Marcus, Architects.

Front Brick: Harbison-Walker Refractories Co.
Star Expansion Bolts Used.
Otis Elevators.

NUMBER 12 EAST 87TH STREET, NEW YORK.

Otis Elevators. Geo. & Edw. Blum, Architects

NUMBER 830 PARK AVENUE, NEW YORK.

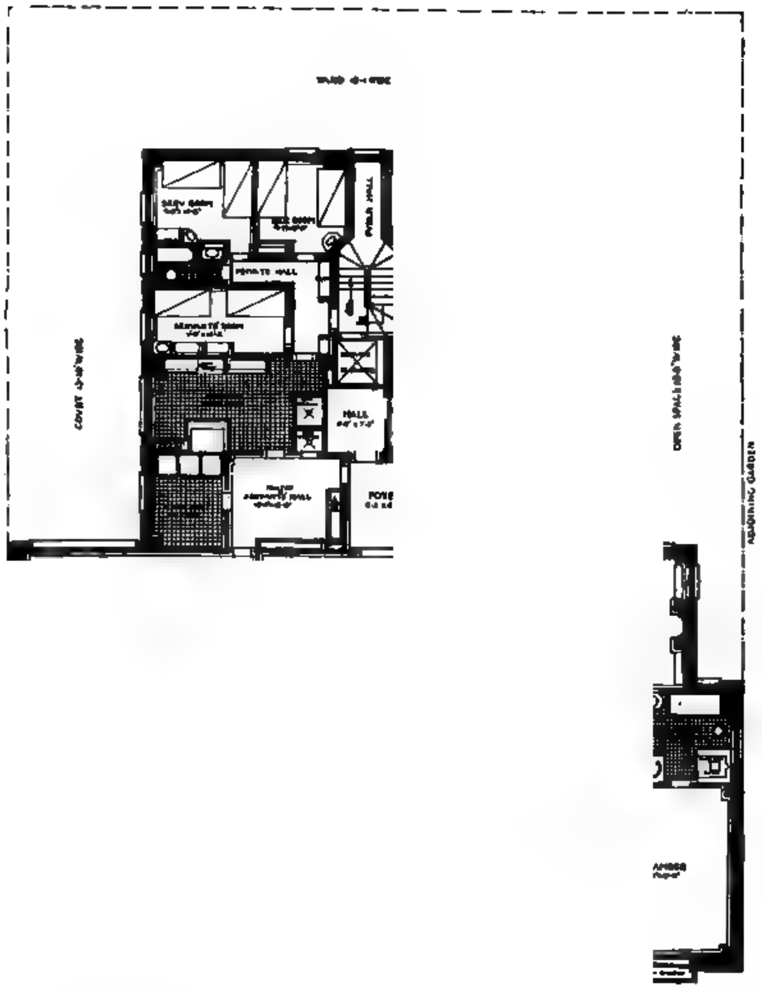
Tapestry Brick: Fiske & Co. Geo. & Edw. Blum, Architects.
Contracting Plasterers: Conroy Bros., Inc
Panel Boards: Metropolitan Electric Mfg. Co.

NUMBER 12 EAST 87TH STREET, NEW YORK.

Interior Trim and Cabinet Work: Kertscher & Co. Geo. & Edw. Blum, Architects.
Lighting Fixtures: Black & Boyd Mfg. Co.

NUMBER 830 PARK AVENUE, NEW YORK.

Lighting Fixtures: Black & Boyd Mfg. Co. Geo. & Edw. Blum, Architects.



NUMBER 12 EAST 87TH STREET, NEW YORK.

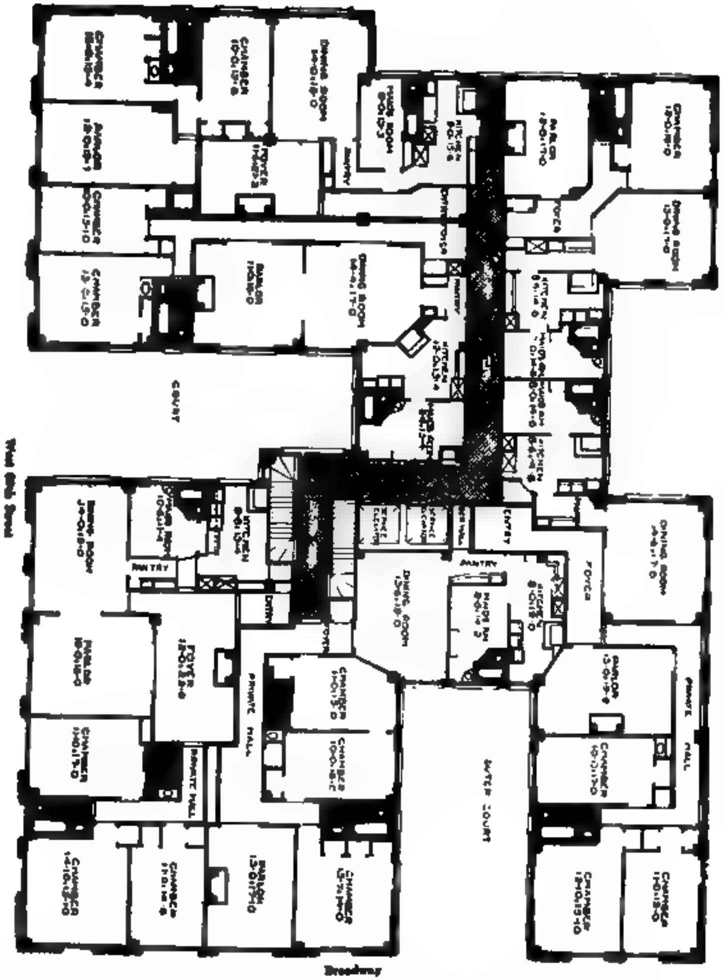
Geo. & Edw. Blum, Architects.

Metal Lath: Arthur Greenfield, Inc.
Lighting Fixtures: Black & Boyd Mfg Co
Otis Elevators.
Architectural Terra-Cotta: Federal Terra-Cotta Co

NUMBER 166 WEST 72D STREET, NEW YORK.

Geo. & Edw. Blum, Architects.

Interior Trim and Cabinet Work: Kertscher & Co.
Electrical Contractors: Porsth Electric Co
Plumbing: Keefe & Murphy.
Window Glass: M. Arnstein
Flushovalves used.
Panel Boards: Metropolitan Electric Mfg. Co.
Window Glass: M. Arnstein.
Lighting Fixtures: Black & Boyd Mfg. Co.

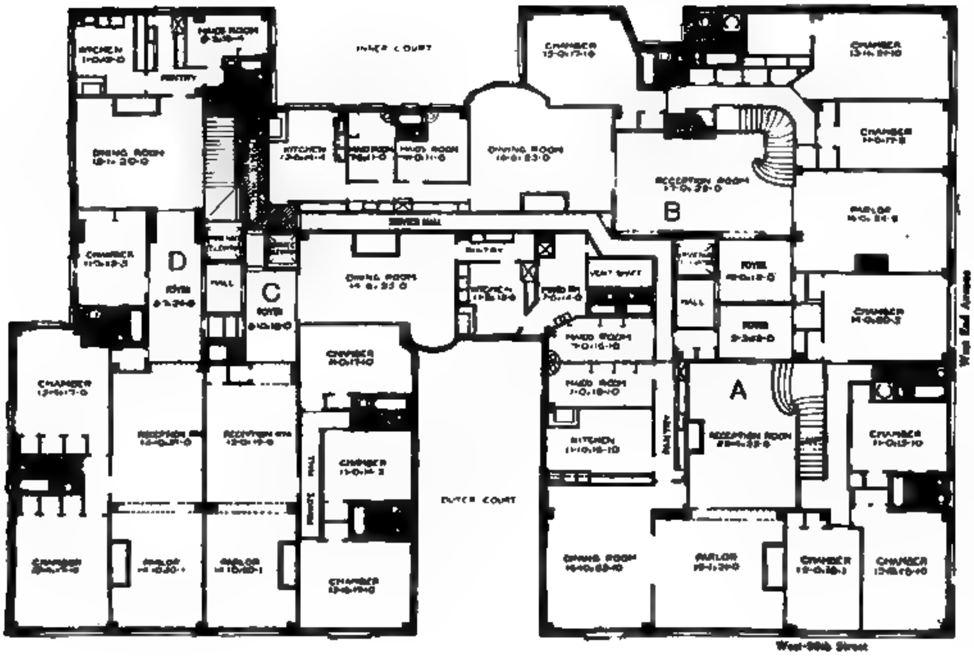


THE ADMASTON, N. W. CORNER OF BROADWAY AND 89TH STREET, NEW YORK.

Geo. & Edw. Blum, Architects.

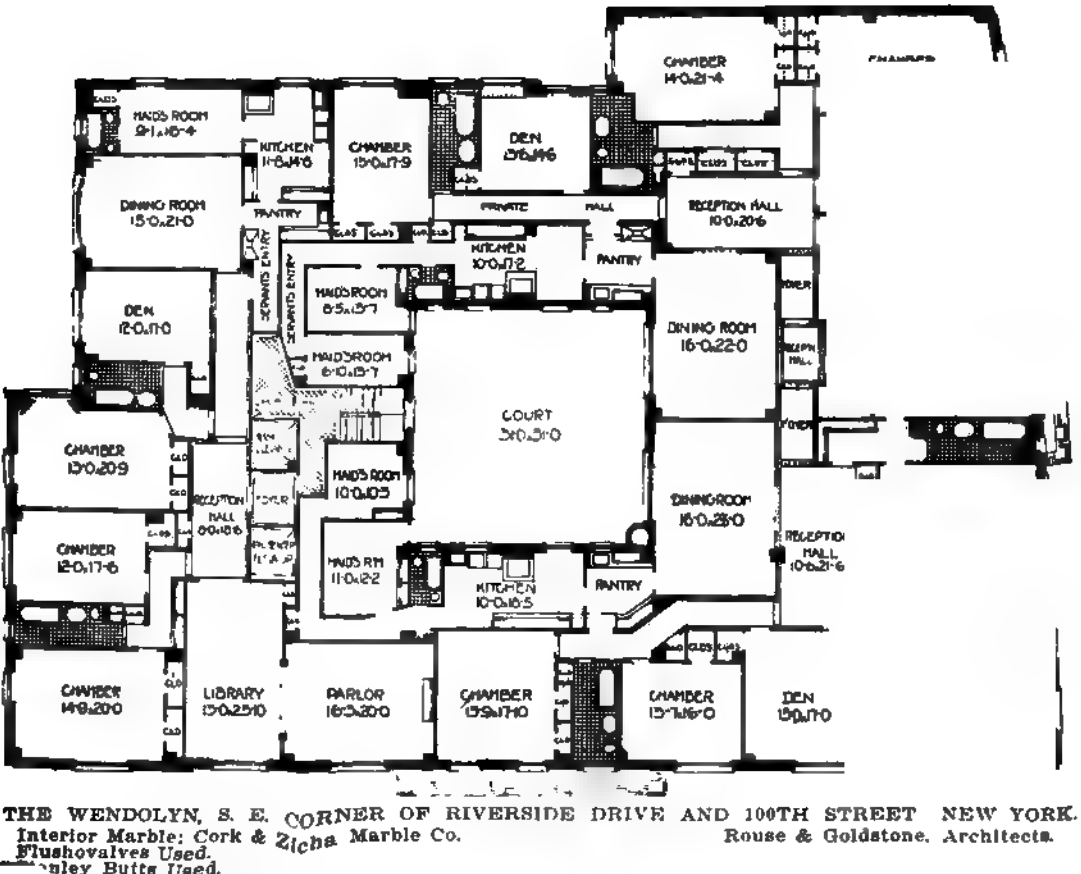
Keystone Flat Finish.
Flushovalves Used.
Plumbing: Keefe & Murphy.
Front Brick: Harbison-Walker Refractories Co.
Metal Covered Windows: Howell, Field & Goddard

Interior Marble: Voska, Foelsch & Sidlo, Inc.
Lighting Fixtures: Black & Boyd Mfg. Co.
Panel Boards: Metropolitan Electric Mfg. Co
Window Glass: M. Arnstein



THE EVANSTON, S. E. CORNER OF WEST END AVENUE AND 90TH STREET, NEW YORK.
Geo. & Edw. Blum, Architects.

Keystone Flat Finish. Flushovalves Used.
Plumbing: Keefe & Murphy. Metal Covered Windows: Howell, Field & Goddard.
Lighting Fixtures: Black & Boyd Mfg. Co. Interior Marble: Voska, Foelsch & Sidlo, Inc.



THE WENDOLYN, S. E. CORNER OF RIVERSIDE DRIVE AND 100TH STREET NEW YORK.
Interior Marble: Cork & Zicha Marble Co. Rouse & Goldstone, Architects.
Flushovalves Used.
...nley Butts Used.
...ing: John Laura & Co.

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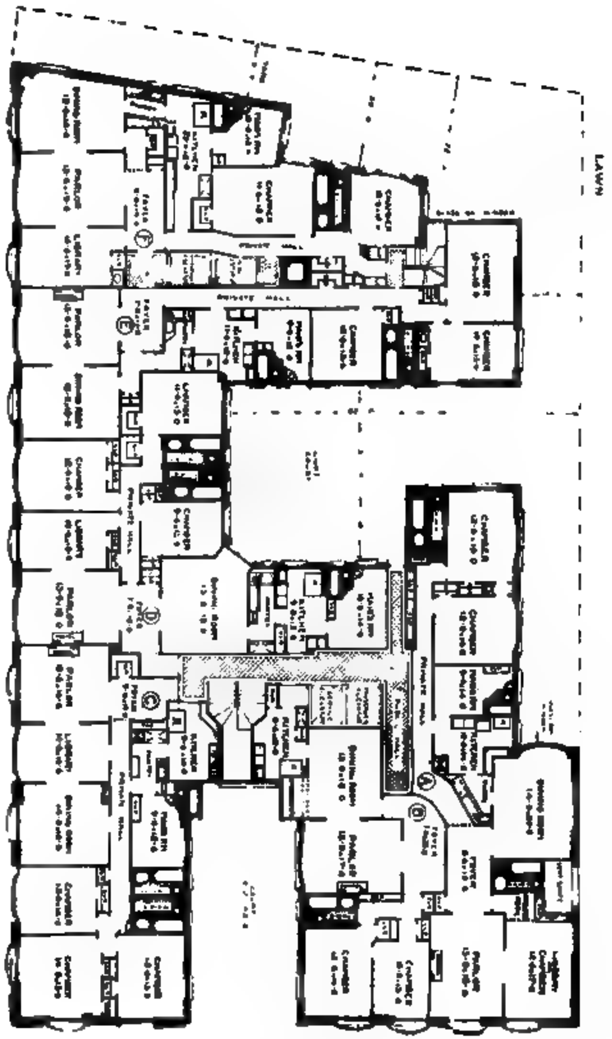


THE BORCHARDT, S. E. CORNER OF 98TH STREET AND BROADWAY, NEW YORK

Rouse & Goldstone, Architects.

Builders: Fleischmann Bros. Co.
Front Brick: Harbison-Walker Refractories Co.
Electrical Contractors: Porath Electric Co.
Stanley Butts Used.
Plumbing: Keefe & Murphy.

Metal Covered Windows: Howell, Field & Goddard.
Otis Elevators.
Flushovalves Used.
Window Glass M. Arnstein

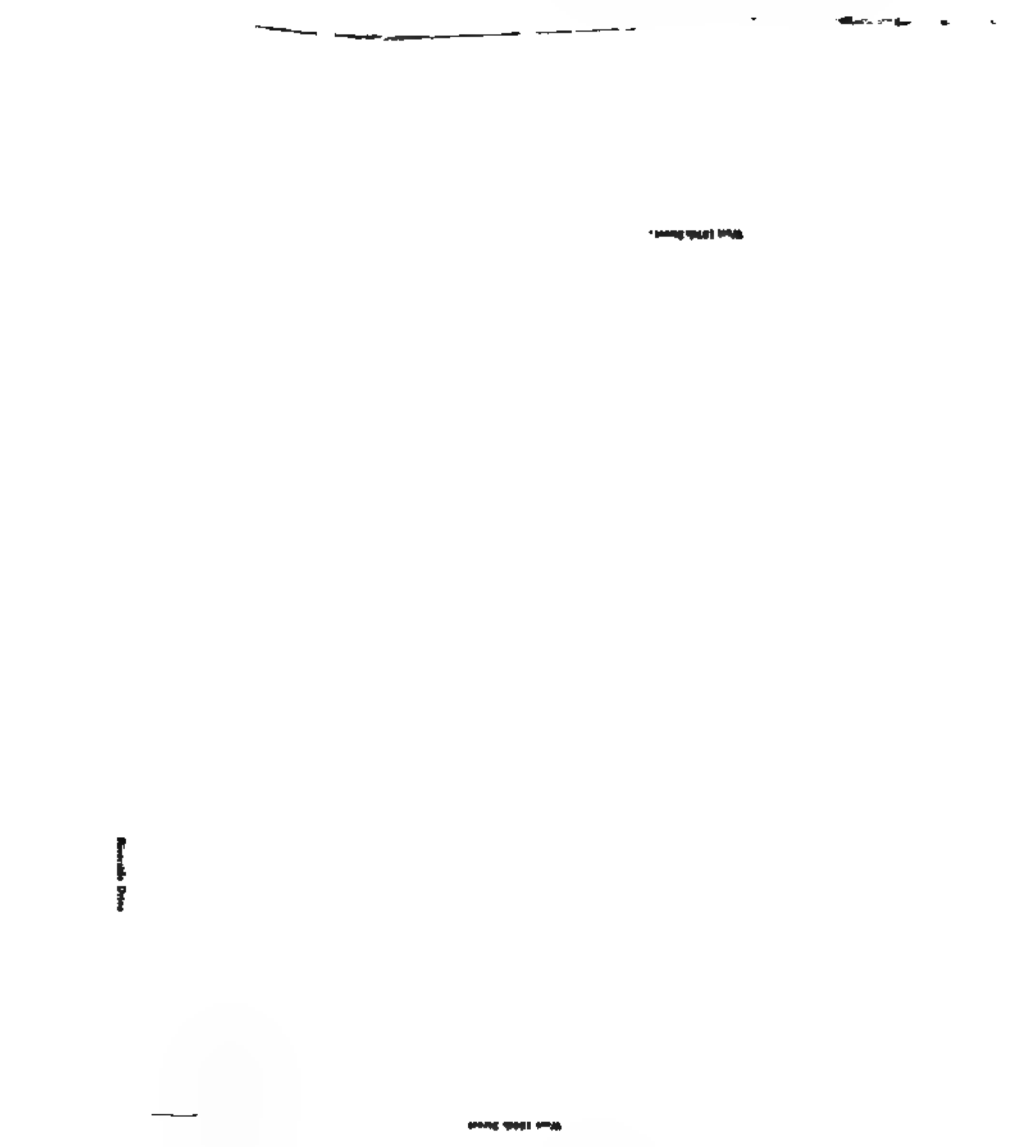
THE RIVIERA, 157TH STREET AND RIVERSIDE DRIVE, NEW YORK. Rouse & Goldstone, Architects
Ornamental and Plain Plastering: Conroy Bros., Inc. Interior Trim and Cabinet Work: Kertscher & Co.
Stanley Butts Used. Lighting Fixtures: Black & Boyd Mfg. Co.
Otis Elevators.

THE BORCHARDT, S. E. CORNER OF 98TH STREET AND BROADWAY, NEW YORK.

Rouse & Goldstone, Architects.

Builders: Fleischmann Bros Co.
Front Brick: Harbison-Walker Refractories Co.
Electrical Contractors: Porsth Electric Co.
Stanley Butts Used.
Plumbing: Keefe & Murphy.

Metal Covered Windows: Howell, Field & Goddard.
Otis Elevators.
Flushovalves Used.
Window Glass. M. Arnstein.



THE RIVIERA, 157TH STREET AND RIVERSIDE DRIVE, NEW YORK.

Rouse & Goldstone, Architects.

Ornamental and Plain Plastering: Conroy Bros., Inc.
Stanley Butts Used.
Otis Elevators.

Interior Trim and Cabinet Work: Kertscher & Co.
Lighting Fixtures: Black & Boyd Mfg. Co.

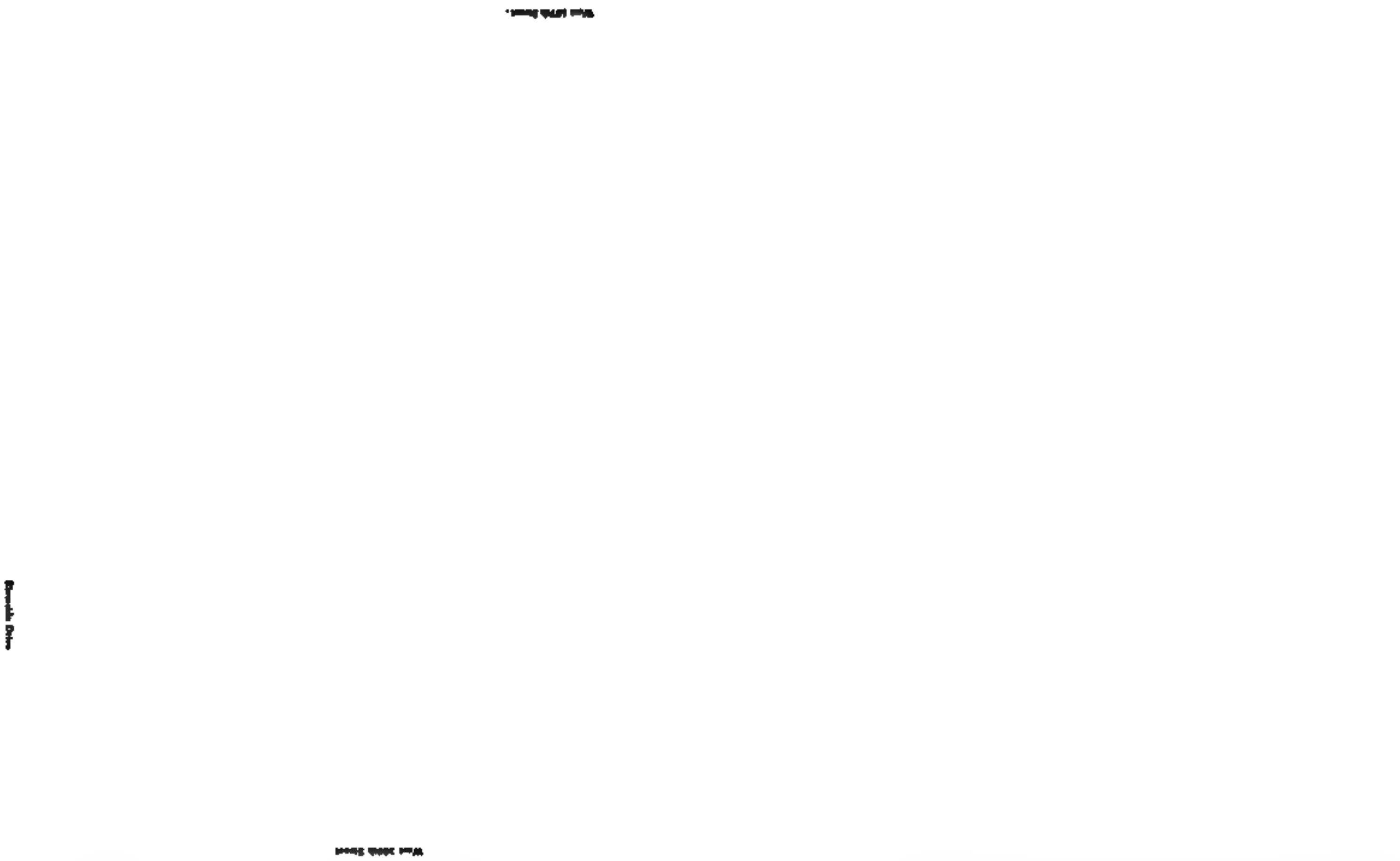
LAWN

THE BORCHARDT, S. E. CORNER OF 98TH STREET AND BROADWAY, NEW YORK.

Rouse & Goldstone, Architects.

Builders: Fleischmann Bros. Co.
Front Brick: Harbison-Walker Refractories Co
Electrical Contractors: Porsth Electric Co.
Stanley Butts Used.
Plumbing: Keefe & Murphy.

Metal Covered Windows: Howell, Field & Goddard.
Otis Elevators.
Flushovalves Used.
Window Glass. M. Arnstein

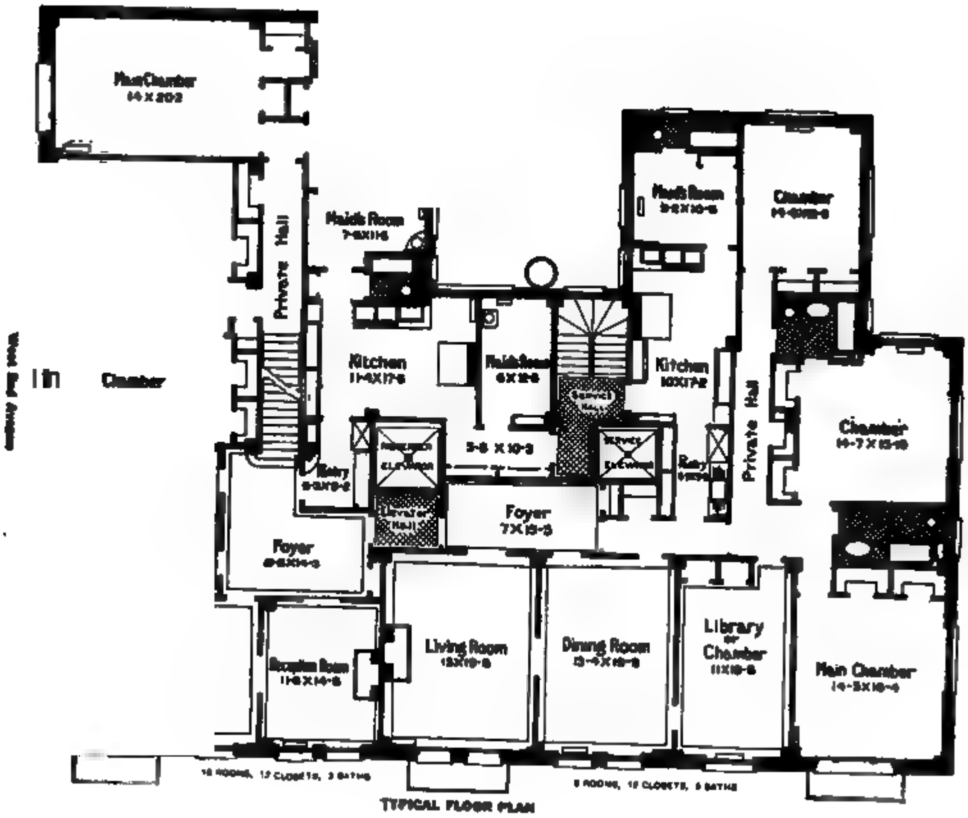


THE RIVIERA, 157TH STREET AND RIVERSIDE DRIVE, NEW YORK.

Rouse & Goldstone, Architects.

Ornamental and Plain Plastering: Conroy Bros., Inc.
Stanley Butts Used.
Otis Elevators.

Interior Trim and Cabinet Work: Kertscher & Co.
Lighting Fixtures: Black & Boyd Mfg. Co.



THE STRAFFORD, 777 WEST END AVENUE, CORNER OF 98TH STREET, NEW YORK.
Schwartz & Gross, Architects.

Farnham's Cheshire Lime Used.
Star Expansion Bolts Used.

SHEDS OVER SIDEWALK DURING CONSTRUCTION WORK

WHEN building operations are being carried on in busy city streets, the protection of pedestrians is a necessity. Sidewalk sheds are usually built by the contractors for this purpose, and on account of the frequently flimsy constructions which were erected, specifications have been drawn up by the Bureau of Buildings for the Borough of Manhattan, New York, which thoroughly cover all conditions. Properly built sheds not alone furnish adequate protection to foot traffic and leave the sidewalk unobstructed, but also keep the street much more free from litter and piles of material. They are also a great assistance to the builder in carrying on construction work; material can be loaded from carts directly to the shed platform; it furnishes temporary storage space, working space and room for contractors' office shanties. We give herewith the text of the special order and the illustrations accompanying it.

"Inspectors shall be governed by the following requirements in the construction of sheds called for by Section 80 of the Building Code, for the protection of pedestrians:

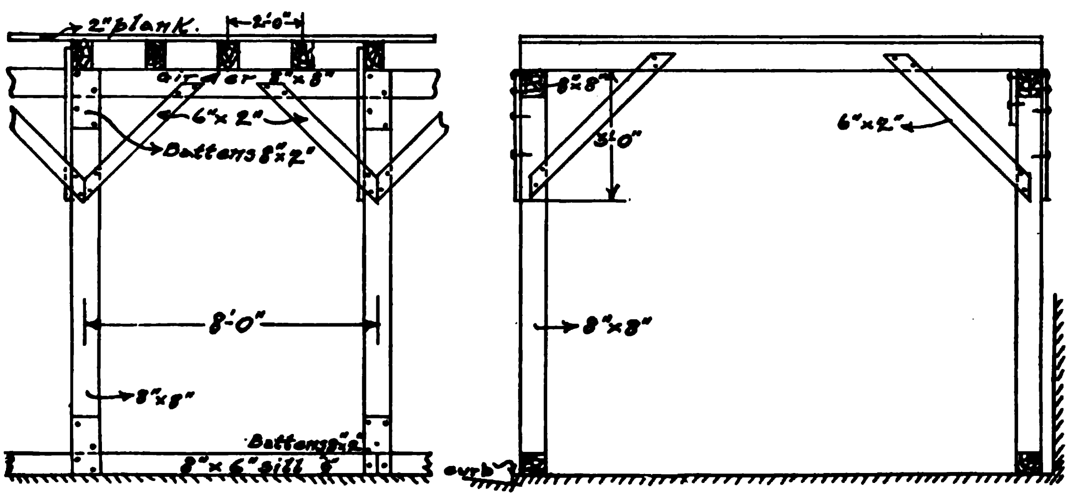
1. The shed shall extend from building line to curb.

2. The shed shall be erected as soon as practicable after the building operation is started, and must be completed before any part of the construction is carried more than thirty-five feet above the curb.

3. The material shall be good, sound timber, and all work shall be done in a substantial manner and shall be securely bolted or spiked.

4. The girders and sills shall be fastened to the posts by means of battens not less than 2" thick and with not less than two 20^d spikes in each member connected.

5. The structure shall be braced by means of knee braces, both longitudinally and across at every post; the braces shall be placed at an angle of about



ELEVATION

SECTION

Scale, ¼" = 1' 0"

45° and shall connect to the posts, beams and girders; the connection to the posts shall be at a distance of not less than three feet below the top.

The bracing shall not be less than 6″ x 2″, and there shall not be less than two 20^d spikes in each member connected.

6. The flooring shall be spiked to the cross beams by sufficient 20^d spikes to hold the flooring securely in place.

7. For buildings exceeding 100 feet in height and where the sidewalks are 10 feet or less in width, beams shall be not less than 10″ x 3″ and spaced not exceeding 2′-0″ center to center; girders not less than 8″ x 8″, posts not less than 8″ x 8″ and spaced not exceeding 8′-0″ center to center; sills not less than 8″ x 6″, and flooring not less than 2″ in thickness.

8. For buildings exceeding 100 feet in height, and where sidewalks are over 10 feet in width, beams shall not be less than 10″ x 4″, and spaced not exceeding 2′-0″ center to center; girders not less than 8″ x 8″; posts not less than 8″ x 8″, and spaced not exceeding 8′-0″ center to center; sills not less than 8″ x 6″, and flooring not less than 2″ in thickness.

9. For buildings exceeding 65 feet and less than 100 feet in height, and where sidewalks are 10 feet or less in width, beams shall not be less than 8″ x 3″, and spaced not exceeding 2′-0″ center to center; girders not less than 8″ x 8″; posts not less than 8″ x 8″, and spaced not exceeding 8′-0″ center to center; sills not less than 8″ x 6″, and flooring not less than 2″ in thickness.

10. For buildings exceeding 65 feet and less than 100 feet in height, and where the sidewalks are over 10 feet in width, beams shall be not less than 10″ x 3″, and spaced not exceeding 2′-0″ center to center; girders not less than 8″ x 8″; posts not less than 8″ x 8″, and spaced not exceeding 8′-0″ center to center; sills not less than 8″ x 6″, and flooring not less than 2″ in thickness.

11. These requirements are for ordinary conditions. If extraordinary loads are to be placed on the shed, heavier timbers shall be used. Deviations from the requirements may be permitted provided the same strength of construction is secured; but all such cases must be reported to the Chief Inspector or Superintendent for approval."

RUDOLPH P. MILLER.
Superintendent of Buildings.

February 5, 1910.

BATH ROOM, APARTMENT HOUSE, S. E. COR. 102D STREET AND RIVERSIDE DRIVE, NEW YORK, EQUIPPED THROUGHOUT WITH RONALDS & JOHNSON CO.'S FIXTURES.

BOOK REVIEWS

REINFORCED CONCRETE. Mechanics and Elementary Design. By John P. Brooks, New York. The McGraw-Hill Book Company. Price, $2 net.

The author states in his preface that this book is intended to supplement the usual college work in mechanics and masonry design; therefore, there is no duplication of these subjects. Sources of information are referred to and extensive quotations in the text are thus avoided. As examples, several designs of reinforced concrete structures are worked out in detail, with particular reference to the proper sequence of computation. The principles of economy in design and diagrams which lead to the proper selection of steel and concrete dimensions are given. The book is intended as a course of directions to enable the reader to effect methods of analysis for design of reinforced concrete structures. The chapters of the book deal with the component parts of concrete, tests, analysis of stresses, including beam theories, columns and beam supports. The last chapter deals with elementary design. Diagrams, curves and tables are used frequently for illustrative purposes.

STRUCTURAL ENGINEERING. By Joseph Husband and William Harby. London: Longmans, Green & Co. Price, $2.60 net.

"Between the theoretical computation of the loads and stresses in a structure and the evolution of a satisfactory practical design which shall have due regard to the exigencies of practical construction, there exists a gap which may only be bridged by considerable practical experience and knowledge of shop methods."

The authors of this book treat the subject of structural engineering from both these views and include a short summary of the properties of structural materials and weights of details, making a brief compendium of the properties of materials. The elastic beam theory has been stated in the fullest and simplest manner, and a brief section is devoted to tall building construction.

The chapters of the book include materials, loads and working stresses, bending moment and shearing force, beams, columns and struts, plate girders, lattice girders, deflection, roofs, miscellaneous applications and tall buildings, masonry and masonry structures.

This book is one that should be of value to American readers, as its treatment of the subject is a very clear and concise one. It has been the endeavor of the authors to steer a middle course between theoretical design and practical construction which is the field that the knowledge of a practical draftsman should embrace.

CONCRETE MONUMENTS, MAUSOLEUMS AND BURIAL VAULTS. By A. A. Houghton. New York: The Norman W. Henley Publishing Co. Price, 50 cents.

This book is a practical treatise on the molding of concrete for the purposes indicated by the title. Plans and designs for mausoleums and burial vaults are given with complete details of construction. The subjects of lettering and ornament have also been treated, simple methods of producing letters being given.

MILL AND FACTORY WIRING. By R. George Devey, A.M.I.E.E. New York: The D. Van Nostrand Company. Price, $1.00.

Electric wiring for mills and factories is discussed in this little book in a technical manner, so as to be useful for wiremen, wiring contractors and electricians who expect to install such work. The book is a working manual of pocket size for easy reference, and is intended as an assistant to the man on the job. The chapters cover methods of wiring, wire and connections for electric power and lighting, wire calculations and tables, and layout of wiring network in factories. The particular advantage of the book is the concise form in which the information is placed, which renders it quickly available without a long search through its pages.

PRACTICAL CEMENT WORK. By W. B. Henry. The Concrete Age Publishing Company, Atlanta, Ga., Publisher. Price, 50 cents.

This pamphlet is an elementary treatise on cement construction. Its first part is general, and the second part deals with construction work and the use of cement in building dwelling houses. The use of cement blocks and cement stucco is treated.

A new sketching paper designed for use in producing isometric drawings without extra figuring, has been prepared. This is put up in pads of 40 sheets, 6x9 inches, at 25 cents, and 40 sheets 9x12 inches at 50 cents. These are furnished by the Norman W. Henley Publishing Company.

Art and Architecture

On March 13 at the National Arts Club, 15 Gramercy Park, there will open an exhibition of pictures of national parks, loaned by the United States Department of the Interior. The exhibition will be under the auspices of the American Scenic and Historic Preservation Society.

Johns Hopkins University is about to begin the construction of an extensive group of buildings intended to house all its activities except those of the hospital and medical school. These buildings will be erected upon a rolling and admirable site of 150 acres fronting on Charles Street, Baltimore The grounds include the fine Colonial mansion, "Homewood," which will remain in the midst of the university buildings and will be the key-note of their style. The group will contain laboratory buildings for chemistry, physics, biology, geology and engineering, which will center about the main feature, the great academic and library building. In addition, there will be dormitories, refectories, a students' hall and gymnasium. The total cost will run into the millions of dollars. The trustees who have been studying this problem for some time, have just made an announcement of the advisory board of architects, consisting of Mr. Grosvenor Atterbury of New York, Mr. Frank Miles Day of Philadelphia, and Mr. Frederick Law Olmsted of Boston. This board has been making a re-study of the problem for some time, and it is expected that their report will be in shortly with the result that actual construction work on the buildings will be started this coming Summer.

At the regular January meeting of the San Francisco Chapter A. I. A., Mr. Faville presented a report on "Arichtectural League and Education." The report referred to the first traveling scholarship competition. There were 27 competitors entered for this competition. The prize consisted of $1,000, which is to be used for the pursuit of architectural studies in accordance with an itinerary approved by the education committee.

Attention was called to the fact that the next convention of the Architectural League of the Pacific Coast will be held in Los Angeles on February 23 and 24, and that the drawings submitted in the competition will be on exhibition there.

A most important matter came before the Chapter in the report of the Civic Improvement Committee. The majority report on a civic centre chose the old site of the City Hall and adjacent property as the best location for the centre. In a supplementary statement to this report, Mr. John Galen Howard, the Chairman, said: "We conceive of the civic centre of San Francisco as a great metropolitan grouping, upon largest lines, of not only the City Hall and the buildings immediately subsidiary to it, and now contemplated, but also of museums, theatres, opera houses, libraries, clubs and other semi-public buildings, churches, galleries, hotels, high class office and government buildings, etc., etc., united and embellished by parks, squares, avenue and boulevards in a harmonious and magnificent whole."

The December, 1911, issue of Technology Architectural Record is a commentary on the services of Professor Francis Ward Chandler, who has been head of the architectural department of the Massachusetts Institute of Technology for 23 years. Following Professor Chandler's resignation in November, he was appointed Professor of Architecture Emeritus. The issue is an appreciation of Professor Chandler as an architect, a teacher and a man. It contains a fine portrait.

At the January meeting of the Philadelphia Chapter A. I. A., Mr. C. A. Ziegler, chairman of the committee on the preservation of historical monuments, reported that the arrangements for the restoration of Old Congress Hall had been completed, and that the first contracts for work had already ben signed. Mr. Frank Miles Day gave his impressions of the work accomplished during the past year by the Institute and the evening was principally given up to a full discussion of the events of the 45th annual convention in Washington.

In the Journal of the Association of Engineering Societies for December, 1911, there is an article by R. B. Ketchum on the "Economical Design of Reinforced Concrete Beams." In the course of the article, which is highly technical, tables and curves of the results obtained from tests are given.

A. I. A. COMMITTEE ON PUBLIC INFORMATION.

According to the resolution adopted at the last annual convention of the American Institute of Architects, it is the purpose of this organization to form committees on public information at each of its Chapters throughout the country. There are 32 Chapters at present, and of these a number have already provided such committees, notably the Boston, San Francisco and Philadelphia chapters.

Messrs. D. K. Boyds, Glenn Brown and Frank S. Baldwin have been appointed a committee of public information for the American Institute at large.

Resolution Adopted at 45th Annual Convention.

Resolved, That the Board of Directors be requested to appoint a Special Committee on Public Information, the duties of which shall include the following:

To keep a record of such published matter as may be of interest to the profession and to send to such publications likely to be interested, information concerning the work of the Institute and of the profession.

To request monthly reports on matters of interest to the profession from Committees on Public Information of the several Chapters which chapter committees shall be sub-committees for their respective territories of the Institute committee.

To inform the press of the country in regard to annual conventions of the Institute and the work which the Institute is undertaking and has actually performed. To correct through the press, popular misconceptions with regard to the practice of architecture and to rectify erroneous printed statements affecting the profession.

To keep constantly before the public the aims, aspirations and accomplishments of the profession through its organized body, the Institute.

The United States Civil Service Commission announces that an examination will be held on March 20-22, 1912, to fill a vacancy in the position of electrical and mechanical engineer in the quartermaster's department at large, New London, Conn. Full particulars may be obtained from the United States Civil Service Commission, Washington, D. C.

At the National Arts Club last month, among the interesting exhibits of paintings which were held, was a collection of the work of Otto Walter Beck. Mr. Beck is now teaching illustration and normal work in Pratt Institute, Brooklyn.

(Continued on page 30.)

Fireproofing and Fire-Protection

MR. G W STEWART

"THE AMERICAN FIRE WASTE AVERAGES $250,000,000 PER YEAR. THIS IS $30,000 PER HOUR OR $500 PER MINUTE."

This quotation is the leading sentence of the history of the National Fire-Protection Association which is told in a short pamphlet. It behooves every architect to make himself familiar with the purposes and progressive spirit of this association. We do not plead this from general economic reasons, but from the special economic reason that every architect must make his own living, and success in his profession nowadays is synonymous with keeping abreast of the times, and a thorough knowledge of fire-protection and preventive methods is a professional necessity. The National Fire-Protection Association, 87 Milk Street, Boston, Mass., should receive the support of every architect.

THE EDUCATIONAL FIRE.

Editorially, we are not interested in the average fire. It is usually the same old story of a non-fireproof building, improperly built, poorly equipped and most everything else wrong about it. That such a building burns down is no wonder, and it is a waste of time to talk about it specifically. When a fire occurs in a well-equipped building or a protected structure, it is another matter, for it is from these that we may expect to learn a lesson or increase our knowledge as to how our equipment may be bettered.

Recently a fire occurred in a carpet factory in one of the Bush Terminal Company's structures, Building No. 19, foot of 39th Street, South Brooklyn. It was a quick, hot fire, and did, according to the newspaper reports of February 17, nearly $25,000 worth of damage. Yet in the upper stories of this building there were other factories within the neighborhood of 1,500 people employed, more than half of them women and girls. Is it not an interesting fact that there was no panic? That the employees looked on at the fire below them

(Continued on page 24)

FIRST AID

to a building threatened by fire is usually sufficient to render unnecessary any further aid. But this "First Aid" must be **really** first. It must be independent completely of human frailties. It must provide for

1. Discovering the Fire.
2. Sending in an Alarm.
3. Attacking the Fire before it gets fairly started.
4. Pouring its water upon the Heart of the Fire.
5. Completely extinguishing the Fire, or
6. Holding it in check until the firemen arrive.

have discovered 15,000 fires, sent in the alarms, and attacked the fires before they grew too large to handle. They poured their water on the exact spot where it was needed, and completely extinguished 10,000 of the fires. The others they held in check.

Our Periodical
The Automatic Sprinkler Bulletin
is full of information on the subject of Sprinkler protection. You will receive it regularly, if you ask for it.

GENERAL FIRE EXTINGUISHER CO.

EXECUTIVE OFFICES: PROVIDENCE, R. I.

Plants, Warehouses and Offices in Principal Cities of United States and Canada

40-25

more or less as a spectacle, while the firemen fought the blaze? To find the reason for this, we must consider the construction of the Bush Terminal buildings. Concrete structures, with nothing structural to burn about them, fully equipped with automatic sprinkler systems and alarms that begin the fight on the fire long before the fire companies arrive, it is no wonder that the firemen soon got the fire under control. Another interesting point was the protection of communication throughout the building; hallways, stairways and shafts were enclosed at their openings by automatic fire doors, which, closing on fusible links, closed all openings into the burning area and with all windows protected with metal frames and wire glass, prevented the spread of smoke and fumes throughout the halls and shafts. No wonder that there were no panic conditions among employees.

All openings to the elevator hatchways (194 in number) were equipped with the Peelle underwriter counterbalance fire doors.

SPECIFICATIONS FOR STUCCO ON METAL.

The Associated Metal Lath Manufacturers have issued a typical specification for stucco on metal which has been prepared with great care and embodies the efforts of representatives from the principal manufacturers of the United States. The specification covers framing and general construction, furring, insulation, corner bead, lathing, plastering and stucco on brick. It is a useful paper for an architect, and may be obtained by addressing the Association at 812 Wick Building, Youngstown, O.

Do not be fooled by the word "fireproof." Until we write on slabs of steel, sit on chairs of asbestos, wear shoes of concrete and trousers of tin, absolute fireproofing is impossible. A powder mill might be fireproof in construction, yet people are not in the habit of making it a smoking room. When you hear "fireproof construction," remember that many things are only skin deep—the contents count.—*Grinnell Automatic Sprinkler Bulletin.*

(Continued on page 26.)

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January

CLAY PRODUCTS EXPOSITION.

The Clay Products Exposition, which is to be held in the Coliseum, Chicago, is to open March 7 and continue until March 12. It will decidedly pay any architect or builder, or we may even broaden the field and say, anyone who ever expects to own a home of his own or be the owner of a building of any kind, to visit this show if he can get there. The exhibition will be a comprehensive one as far as clay products go, and will deal very broadly with the fire-resisting and fire-protective developments of clay products.

Fiske and Company are among the exhibitors in this exposition, and among other things, will show a replica of one of the doorways of the new Grand Central Terminal Station, New York City, which is to be executed in tapestry brick. They will also exhibit some of their beautiful fireplaces.

FEDERAL TERRA COTTA CO. ANNUAL MEETING.

At the annual meeting of the stockholders of the Federal Terra-Cotta Company held January 29, 1912, the following were elected directors for the ensuing year:

Berwind, John E.	Grant, Madison
Bond, Alfred H.	Manice, Wm.
Dinsmore, Wm. B.	Morris, Lewis R.
Fish, Stuyvesant	Schieffelin, Schuyler
Grant, DeForest	Taylor, Dwight W.

Thorne, Edwin

and at a subsequent meeting of the directors, the following officers were elected

DeForest Grant, President
Edwin Thorne, 1st Vice-President
Wm. Manice, 2nd Vice-President
Wm B. Dinsmore, Treasurer
Dwight W. Taylor, Secretary and Asst. Treasurer

COMMISSION GOVERNMENT.

An illustrated quarto entitled "One Year and Eight Months Under Commission Government," has been issued by the city of Memphis. The statement is an important one to the political economist and also to that class interested in municipal improvement, which includes many architects. Under the commission government, Memphis has made rapid progress in the erection of public buildings and the betterment of civic conditions.

An article appeared in a recent issue of the "Automatic Sprinkler Bulletin" on the sprinkler equipment of the Masonic Home at Utica, N. Y. This building is equipped with 3,330 Grinnell automatic sprinklers. This equipment is interesting in an institution of this character.

(Continued on page 28.)

The building operations in Pittsburgh for the year 1911 have just been compiled The sum total of new construction during 1911 totaled $7,503,505. Additions totaled $1,886,173 and alterations $2,288,866. Among the important structures built in Pittsburgh during 1911 were: Harris Theatre, $125,000; First National Bank addition of 21 stories; Schenley Farms residence (17), $130,000; Colfax School, $200,000; City Pumping Station, $125,000; paper warehouse, $180,000; St. Agnes School, $90,000; Union Steel Casting Company addition, $700,000; Shadyside apartment house $164,000; Allegheny General Hospital addition, $50,000.

Keying an "ad" and paying a clerk to keep tabs on "inquiries" is good business in a ten-cent mail order proposition, but doesn't work out on anything bigger. We know a wall-board man who got 480 inquiries from a farm journal "ad," sent out a stack of catalogues and booklets, chased follow-up letters out in one-two-three order and has yet to sell a single foot of the board to any of the idle curious who answered his advertising. The same manufacturer got but two inquiries out of an "ad" in a building magazine, but sold both parties.—The Builders' Guide, Philadelphia.

ERRATUM.

Under two views of Miner's Empire Theatre, Newark, N. J., shown on page 43 of the January issue of ARCHITECTURE AND BUILDING, credit was given McMurray & Pulis, as architects. This, however, was incorrect, for McMurray & Pulis and George Keister were jointly the architects for this theatre. The editors of ARCHITECTURE AND BUILDING offer their apologies for this error and take pleasure in availing themselves of this opportunity to rectify it.

(Continued from page 21.)

CONFERENCE ON PEOPLE'S BATHS.

An international conference on people's baths and school baths will be held during the last week of August, 1912, at Scheveningen (The Hague). The purpose of this meeting is to promote interest in public baths and to compare notes as to results obtained from various existing establishments in different parts of the world. Four sessions will be held and delegates from municipalities and civic improvement societies are expected from many countries.

"Street Lighting," by J. M. Bryant and H. G. Hake is issued as Bulletin No. 51 of the Engineering Experiment Station of the University of Illinois.

This bulletin is designed to supply needed information on the subject of efficient and economical street lighting by electricity. Starting with the characteristics of modern arc and series incandescent lamps, the principles of illumination are explained. These principles are then applied to the illumination of the street, curves and tables being given to show the amount of light distribution at various distances from the lamps.

Copies of Bulletin No. 51 may be obtained gratis upon application to W. F. M. Goss, Director, Urbana, Ill.

In Graphite, issue of January, 1912, there appears a fine illustration of the interior of the Long Island City power station of the Pennsylvania, New York and Long Island Railroad. This shows the equipment of turbine-driven generators and also the construction of the power house.

The Keuffel and Esser Co. have issued their usual small pocket calendar for the coming year. This is a useful device and will be sent to any architect upon request.

The Samuel H. French Company of Philadelphia have issued a 1912 pad calendar which esrves as a convenient memorandum for the desk, and also keeps French's products constantly in mind.

In the December, 1911, issue of the Journal of the American Society of Engineering Contractors, there appeared an article entitled "The Cement Gun" in the course of which its application to architectural work was considered. One illustration showed the use of the cement gun in covering steel work at the new Grand Central Terminal, New York. Other illustrations showed the use of this device for stuccoing house exteriors, building fences, etc. This process gives a particularly fine stucco coating that adheres thoroughly to the support and gives the best possible bond.

In the January issue of Building Progress, the first of a series of articles by Melville McPherson, "The Spanish Renaissance in America," appeared. The illustrations are extremely attractive and well chosen. The paper is the house organ of the National Fire Proofing Company of Pittsburgh.

The second annual Architecture and Engineering Exhibition, which will be held in the 71st Regiment Armory on March 25th to 30th, will make a special feature of showing models and designs of buildings. Architectural and engineering schools are contributing material, and many architects are also loaning models and drawings for exhibition. Comprehensive exhibits of building supplies, materials and accessories will also be made and in conjunction with the exhibition a conference of architectural, building, contracting and engineering interests will be held, particular attention being devoted to the fire waste and its reduction and also to suburban home building in addition to the great architectural, enginering and building achievements of the present day.

Industrial Progress

CORBIN DOOR CHECK AND SPRING—1911 MODEL

It is adaptable for right hand and left hand doors without change.

It is supplied with or without the hold-back attachment The hold-back attachments can be adjusted to stop the door at any point.

The spring used is long and resilient, reducing the crystallization to a minimum and giving a quick, live action, which is highly desirable.

The spindle has a lower bearing which absolutely prevents side pressure or friction and gives rigidity to the check.

The rack and pinion in the check give control to the door at all points from the wide-open to the closed position. The movement in closing is steady, without shock or jar at any point.

The parts are few and strong, easily accessible and quickly replaced.

The liquid used is one which has been carefully compounded with a view to securing immunity from changes due to difference of temperature. It is non-freezing and not affected by extreme heat.

(Continued on page 34.)

KEYSTONA FLAT FINISH

The checking pressure is confined to the cylinder. There is no pressure at the spindle so that the liquid is not forced upward and the check will not leak.

The brackets used are the same as used with other models of the Corbin check.

Six sizes are made to swing all doors from the lightest screen door to the heaviest doors made.

Volume IX, the 1911 edition of the American Art Annual, has been issued. It contains the usual volume of interesting and useful information.

The Journal of the Western Society of Engineers for December, 1911, contains a most valuable technical article on the new passenger terminal of the Chicago and Northwestern Railroad Company.

The Journal of the Franklin Institute for January, 1912, contains an article, "What Makes White Lead Chalk, and How Chalking May be Prevented," by Henry A. Gardner.

The Nutley Realty News, Vol. 1, No. 1, has appeared with the first of January. This publication is intended to promote the interests of Nutley, but incidentally shows numerous illustrations of small suburban houses.

The Canal Record of January 10, 1912, has an article on "Erecting Lock Machinery," showing diagrams of the lock-operating devices. It will be of interest to hydraulic engineers.

LIGHTING FIXTURES.

Lighting fixtures of a special design are manufactured either in accordance with the designs furnished by the architect, or from sketches worked out by the architect in collaboration with the manufacturers, where the draftsmen for the manufacturer elaborates and perfects the design drawings. The Consolidated Chandelier Company are prepared to co-operate in this way with architects in the matter of their designs, accommodating the patterns of the fixtures to meet the interior decoration of rooms, halls or larger places of assembly. Further, they carry a large quantity of stock fixtures and designs which may often be combined and adapted to suit, without the necessity of making up special fixtures. This firm has recently installed lighting fixtures in a number of apartment houses, notably the Grinnell at Riverside Drive and 157th Street, and 309 West 99th Street, both of which are illustrated in this issue. They would be pleased to submit estimates on work and to co-operate with architects. Their address is 132-136 West 14th Street, New York City.

FIRE PREVENTION

Architecture and Building is about to present a series of articles dealing with the practical preventive measures of this now country wide movement to check our great national extragavance: ***The Annual Fire Waste.***

Automatic Sprinkler Equipment of Loft Buildings is the first subject to be treated. These articles will be written by Mr. E. P. Boone, Superintendent of the Automatic Sprinkler Department, New York Fire Insurance Exchange.

The architect stands between his client and the outer darkness on all points of building construction. With ever increasing frequency, these days, is he called upon to explain a sprinkler system, outline the method of its installation, and give its approximate cost.

These articles by Mr. Boone will be a practical study of sprinkler, standpipe and supply tank equipments, considered as a portion of the original building design. It is the author's intention to give that amount of technical information which is necessary to a good understanding of the practical principles of an automatic sprinkler equipment without an engineering treatment of the hydraulic problems involved. The illustrative drawings which have been prepared are taken from actual, approved installations. They show sprinkler equipments in several types of building, and illustrate how a building of any particular class may be properly equipped.

The complete series will give the full information that it is necessary for an architect to have in planning a building in which he expects to install a fire protective equipment.

THE AMERICAN FIRE WASTE AVERAGES $250,000,000 PER YEAR

ARCHITECTURE
AND
BUILDING

A Magazine
Devoted to Contemporary
Architectural Construction

Vol. 44 March 1912 No. 3

Automatic Sprinkler Equipment of Loft Buildings

By E. P. BOONE

Fireproofing and Fire-Protection

Published by
THE WILLIAM T. COMSTOCK COMPANY
23 Warren Street New York

$2.00 a Year 20¢ a Copy

Alphabetical List of Advertisers

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Manual Arts Press, The, 600 German Fire Insur. Bldg., Peoria, Ill.

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Grant Pulley & Hardware Co., 3 W. 29th St., N. Y.

REFRIGERATORS, PORCELAIN, ETC.
Tettenborn Refrigerator Co.....Cincinnati, O.
White Enamel Refrigerator Co. of New York, 59 W. 42d St., New York

RINGS—Bridle, Corner Brace (Bridle), Sebco Aerial.
Star Expansion Bolt Co..147-149 Cedar St., N. Y.

ROLLING DOORS AND SHUTTERS—Steel.
Grant Pulley and Hardware Co., 3 W. 29th St., New York City.
Wilson Mfg. Co., James G., 3 W. 29th St., New York

ROOFING AND ROOFING MATERIALS.
Barrett Mfg. Co...............New York, N. Y.

SANITARY SPECIALTIES.
A. P. W. Paper Co...............Albany, N. Y.

SASH CHAINS.
Morton, Thomas.............169 Elm St., N. Y.

SASH CORDS.
Silver Lake Co..................Boston, Mass.

SASH LOCKS.
Ives Co., The H. B..........New Haven, Conn.

SASH PULLEYS—Iron, Brass, Bronze.
Grant Pulley & Hardware Co., 3 W. 29th St., N. Y.

SELF-CLINCHING NAILS.
Self-Clinching Nail Co.........Philadelphia, Pa.

SIDEWALK LIFTS.
Speidel, J. G......................Reading, Pa.

SIDEWALK LIGHTS.
The Berger Mfg. Co.................Canton, O.

SIGNS, CHANGEABLE, ETC.
U. S. Changeable Sign Co., 3 W. 29th St., New York

SKYLIGHTS.
Architectural Metal Works, 1192-1194 2d Ave., New York.

SNOW GUARD
Folsom Snow Guard Co., Roslindale (Boston), Mass.

SPRING HINGES.
Bommer Bros....257 Classon Ave., Bklyn, N. Y.
Chicago Spring Butt Co., Chicago, Ill.; New York.

SPRINKLER SYSTEMS.
General Fire Extinguisher Co., Providence, R. I.
Rockwood Sprinkler Co...128 William St., N. Y.
Vogel Co., H. G............12 Walker St., N. Y.

STEEL BUILDINGS.
Van Dorn Iron Works Co.........Cleveland, O.

STEEL JOIST HANGERS.
Lane Bros. Co............Poughkeepsie, N. Y
Van Dorn Iron Works Co..........Cleveland, O.

STUCCO.
Monument Plaster Co...........Harrison, N. J.

TACKLE BLOCKS (Automatic).
Lane Bros. Co............Poughkeepsie, N. Y.

TERRA COTTA.
Federal Terra Cotta Co...111 Broadway, N. Y.
New York Architectural Terra Cotta Co., 401 Vernon Ave., Long Island City, N. Y.
Northwestern Terra Cotta Co. 1000 Clybourn Ave., Chicago

VALVES.
Flushovalve Co.......71 Greenwich Ave., N. Y.

VAULT LIGHTS.
Berger Mfg. Co.....................Canton, O.
Brooklyn Vault Light Co. 262 Monitor St., Brooklyn, N. Y.

VENTILATING LOCKS.
H. B. Ives Co., The......New Haven, Conn.

VENTILATING RIDGING.
Globe Ventilator Co................Troy, N. Y.

VENTILATORS.
Globe Ventilator Co................Troy, N. Y.
Washburne & Co., E. G...209 Fulton St., N. Y.

WALL FINISHES—FLAT, ETC.
Keystone Varnish Co., 71 Otsego St., Brooklyn, N. Y.

WALL PLASTER.
Monument Plaster Co...........Harrison, N. J.

WATER FILTERS.
Loomis-Manning Filter Co., 828 Land Title Bldg., Philadelphia, Pa.

WEATHER VANES.
Jones, Thos. W........153 Maiden Lane, N. Y.
Washburne & Co., E. G., 209 Fulton St., N. Y.

WINDOW STOP ADJUSTERS AND VENTILATING LOCKS.
Ives Co., The H. B..........New Haven, Conn.

WIRE ROPE.
Broderick & Bascom Rope Co., 809 North Main St., St. Louis, Mo.

WOOD-WORKING MACHINERY.
Barnes Co., W. F. & John, 566 Ruby St., Rockford, Ill

ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

Volume XLIV. MARCH, 1912 *Number 3*

THE MULTIPLE RESIDENCE

An Essay, with a Description of

NUMBER 998 FIFTH AVENUE

McKIM, MEAD & WHITE, Architects.

THOUGH under the jurisdiction of the Tenement House Department of the Borough of Manhattan, and classified in the same category as all other buildings which house three or more families under one roof, the building which is the subject of illustration in this article exemplifies a high ideal that its prosaic classification does not indicate. We have called it a "multiple residence" and we have chosen this term because we feel that the ordinary apartment house, which is of course a collection of private dwellings under one roof, has been exceeded in form, thoroughness of construction, amplitude of individual units, service, and most of all in the spirit and aim of its construction. 998 Fifth Avenue can be called without exaggeration the most highly specialized apartment that is now in existence. There are individual buildings which exceed it in size; others which are fully its equal in equipment, accommodation and magnificence of structure. But, being equal to all others from a material standpoint, it exceeds all others in its popularly esteemed location, which bears a significance in connection with the building ranking it the most magnificent of its class.

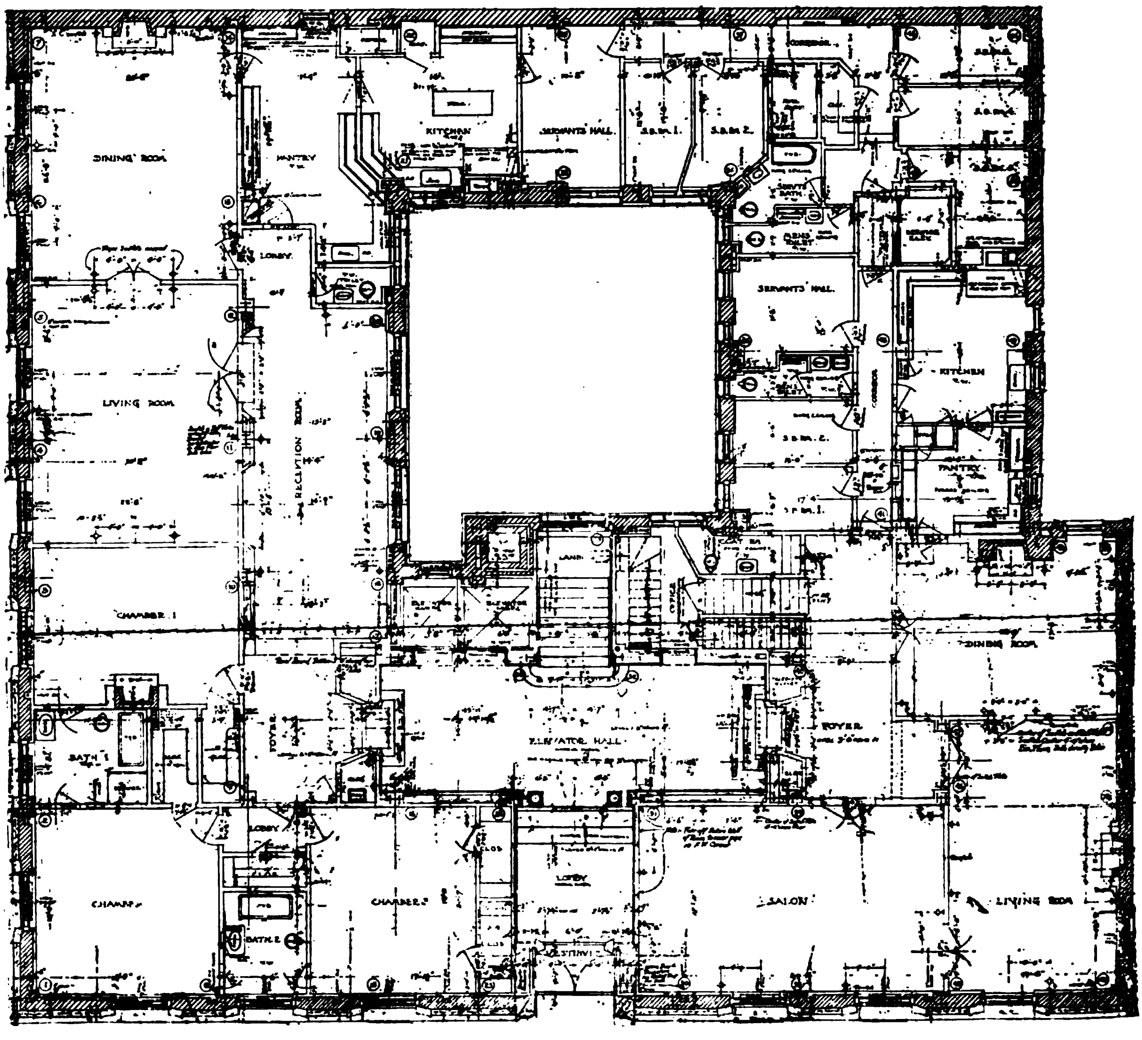
The popular attitude toward the apartment house has undergone a rapid change even in a decade. With that attitude there has been a development in apartment house construction which, making use of every available modern appliance for human convenience and comfort, has raised the finer examples of apartment house buildings to a standard which may be looked upon as being the most perfected of human abiding places from a mechanical standpoint.

The elemental idea of a flat, tenement or apartment house has been one of a combined or cooperative dwelling in which many families could live in small quarters and with an economy impossible in an individual city dwelling. As cities have grown, the multiple dwelling has been developed, and starting in smaller towns with a two or three family house, we find a gradual aggrandizement of the idea until in New York, the most crowded and concentrated city of America, we find its highest development.

Some day a history of the apartment house will be written, and its legend will be a long and interesting one, taking its students back to the five and six story dwellings of the Trans-Tiber where the populace huddled when Rome was ruled by the emperors. The controlling element was then, and will always be, congestion of population and increasing

land values. In the Medieval capitols we will find a phase of the apartment house in the dwelling of the merchant, where, harbored under one roof, there were his shop, his dwelling, and the living quarters of his employees—apprentices and laborers—and their families. In New York City in a few decades a panoramic view of the whole development may almost be seen.

Twenty-five years ago an apartment house was not considered the most desirable place of abode. The private house was the chosen dwelling of people of moderate means; the wealthy built their mansions on Fifth Avenue. Some apartments were built which were of high standard for their time, but they lacked the modern improvements which make the present-day apartment house the ideal city dwelling. Steam heat was unusual; service was unthought of, except for the speaking tube and the dumbwaiter; elevators were unknown; dark windowless bedrooms were considered an unavoidable feature. There was little difference between the apartments considered of high class and the tene-



FIRST STORY PLAN. APARTMENTS AT 998 FIFTH AVENUE.
McKim, Mead & White, Architects.

APARTMENTS AT 998 FIFTH AVENUE, NEW YORK.

McKim, Mead & White, Architects.

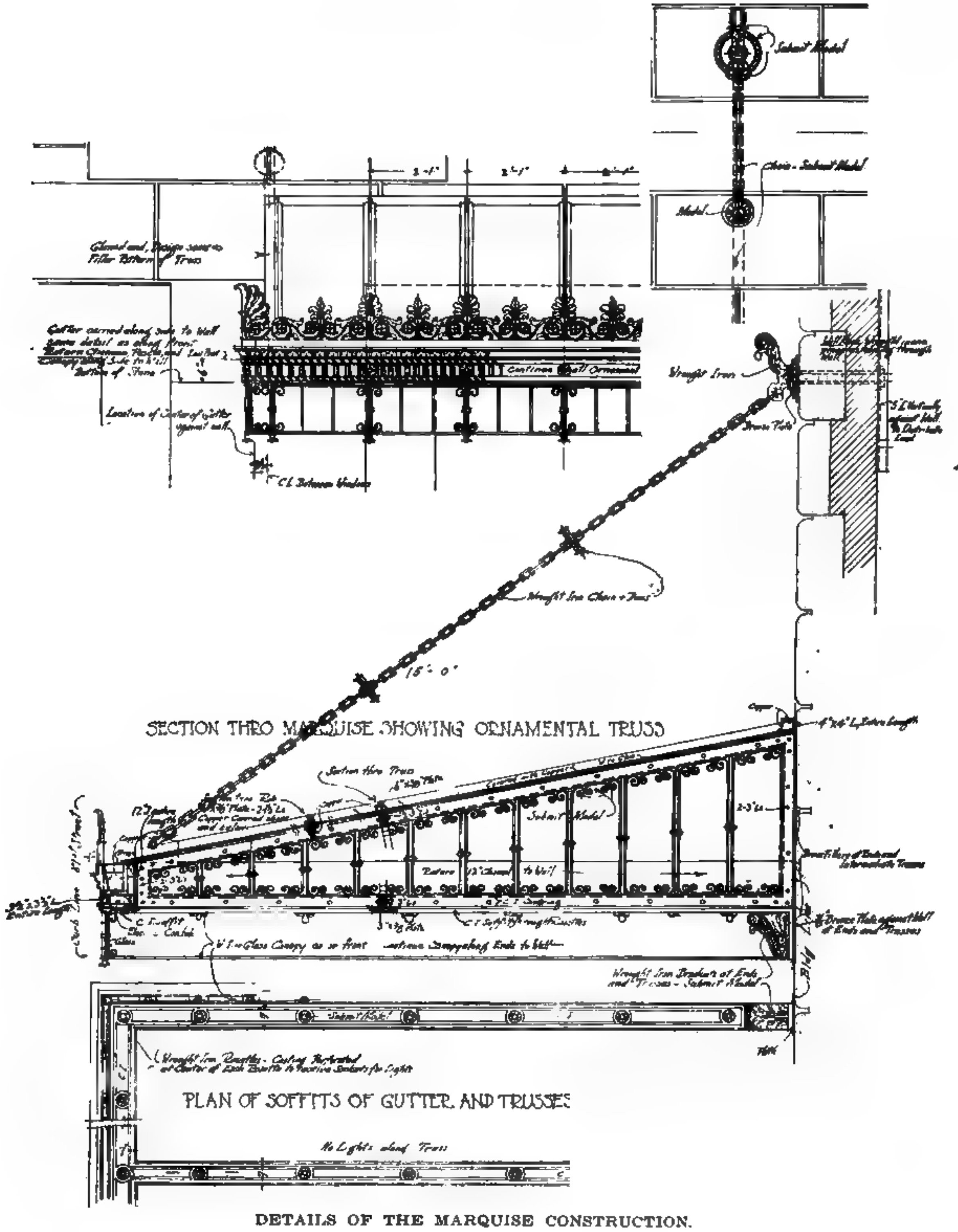
Builders: Century Holding Co.
Cut Stone Contractors: Henry Hanlein & Son.
Architectural Terra-Cotta: New York Architectural Terra-Cotta Co.
Panel Boards: Metropolitan Electric Mfg. Co.
Plumbing Contractors: J. N. Knight & Son.
Window Glass: M. Arnstein.
A. B. See Electric Elevators.
Hardware: Norwalk Lock Co.
Hollow Metal Doors and Trim: Dahlstrom Metallic Door Co.
Refrigerators: White Enamel Refrigerator Co., of New York.
Hardwood Floors: Hasbrouck Flooring Co., Inc.

AT CORNER OF FIFTH AVENUE

A CONSTRUCTION DETAIL.

McKim, Mead & White, Architects

Sanborn Section Sash Weights.
Grant Sash Pulleys.



DETAILS OF THE MARQUISE CONSTRUCTION.

McKim, Mead & White, Architects.

DETAIL OF MARQUISE AND ENTRANCE.
McKim, Mead & White, Architects.
Ornamental Iron: Harris H. Uris Iron Works, Inc.
Hardware: Norwalk Lock Co.
Cut Stone Contractors: Henry Hanlein & Son

THE FIRST STORY ELEVATOR GRILL AND A HALLWAY ON AN UPPER STORY.

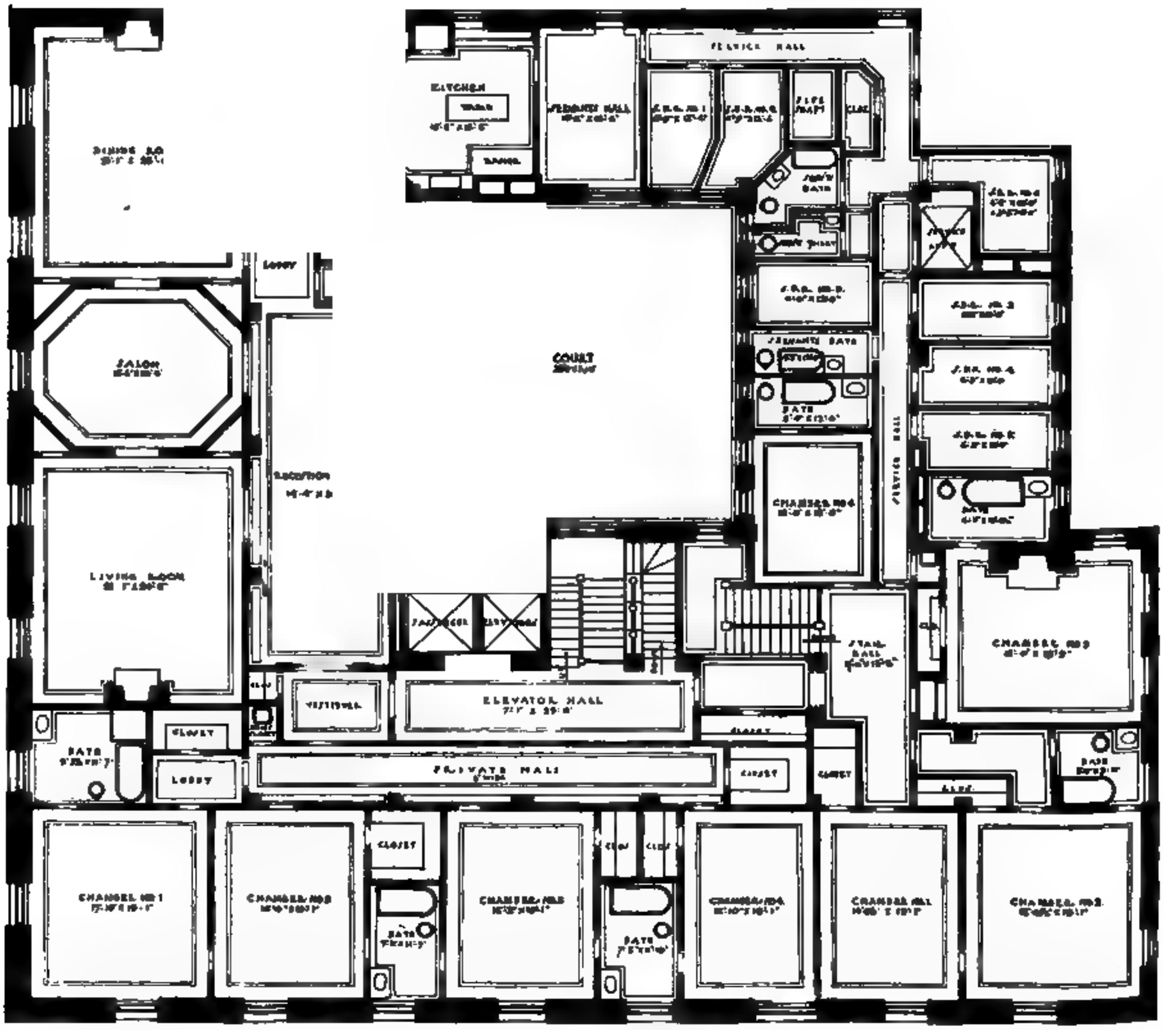
McKim, Mead & White, Architects

A. B. See Electric Elevators.
Hardware: Norwalk Lock Co.
Hollow Metal Doors and Trim: Dahlstrom Metallic Door Co.

ment of the East Side. Their conveniences were about the same and their planning equally poor.

As the population concentrated and land values rose in New York City, the demand increased, and better apartment houses were built which kept pace with the modern inventions and made the fullest use of them. The movement has gone forward with giant strides in the last decade with a resulting change in the popular attitude toward the apartment house as a dwelling. Restricted sections of the city, previously withheld for residential purposes where only private houses might be built, have rapidly changed, springing up as with a mushroom growth into lofty apartment structures into which the families of the house-holders have willingly moved as finding in them a more convenient form of abode.

Fifth Avenue has been regarded for many years as the finest street in America. On it have been built the palaces of our wealthiest citizens. Society has



TYPICAL STORY PLAN SHOWING AN APARTMENT ON A SINGLE FLOOR AND THE SECOND STORY OF A DUPLEX APARTMENT.
McKim, Mead & White, Architects.

TWO VIEWS THROUGH THE PRINCIPAL ROOMS OF A SINGLE APARTMENT.

McKim, Mead & White, Architects.

Hardwood Doors made by the Iroquois Door Co.
Mantels: Wm. H. Jackson Co.
Hardwood Floors: Hasbrouck Flooring Co., Inc.

A RECEPTION ROOM PANELLED IN HARDWOOD.
McKim, Mead & White, Architects.
Hardwood Doors made by the Iroquois Door Co.
Hardware: Norwalk Lock Co.

reigned supreme and held it for its own. With the ever-encroaching invasion of business from the south, however, its residential section has gradually shrunk away from below 59th Street, which would seem to be a natural barrier against the further encroachment of business on the Avenue. Upper Fifth Avenue, facing the park, has filled up gradually with magnificent residences, the dwellings of the most wealthy. That it has been invaded by an apartment house is, to our mind, in no sense a detriment, but merely an indication of the spirit and demand of the times in which we live.

998 Fifth Avenue is a building containing seventeen private dwellings in one structure. It is a suitable structure to its location and its apartments are designed for the residential use of those who could afford to own Fifth Avenue residences and maintain them. As a structure it offers to the dweller therein every convenience of a very large private house, and eliminates many of the disadvantages of the individually maintained city dwelling.

Our description of the building itself is largely pictorial. The plans show the arrangement of the apartments with the exception of some special suites which occupy larger space. The typical arrangement is that of three apartments on two stories—two apartments occupying a portion of a single floor and one duplex apartment, the chambers of which are in the story above.

The exterior is of limestone of a dig-

THE INTERIOR COURT, LINED WITH TERRA-COTTA.

New York Architectural Terra-Cotta Co. McKim, Mead & White, Architects.

nified design. The approach is such as might be appropriate to a large city mansion, amplified slightly to meet the requirements. In finish, the lobby and elevator hall is in keeping with what might be expected in a dignified and tastefully decorated city residence. In the apartments themselves, free rein is, of course, given to the individual taste of those who dwell in them.

The builders of 998 Fifth Avenue were the Century Holding Co. Henry Hanlein & Son were the cut stone contractors. The architectural terra-cotta was supplied by the New York Architectural Terra-Cotta Company. The ornamental iron work was done by the Harris H. Uris Iron Works, Inc. A. B. See electric elevators were used, and the panel boards were put in by the Metropolitan Electric Manufacturing Co. The plumbing contractors were J. N. Knight and Son, and the refrigerators throughout were built by the White Enamel Refrigerator Co. of N. Y. The gas ranges were made by Court & Beals. Sanborn sectional sash weights were used, and Grant sash pulleys. Hollow metal doors and trim were put in by the Dahlstrom Metallic Door Co. The veneered hardwood doors were manufactured by the Iroquois Door Co., and the Norwalk Lock Company installed all the hardware. William H. Jackson Company put in the mantelpieces and fireplaces. The Hasbrouck Flooring Co., Inc., put in the hardwood flooring.

THE KITCHENS OF 998 FIFTH AVENUE ARE EQUIPPED WITH LARGE REFRIGERATORS, CHILLED BY BRINE PIPES FROM A CENTRAL PLANT. FOR COOKING THESE LARGE GAS RANGES ARE PROVIDED.

Refrigerators: White Enamel Refrigerator Co., of New York.
Plumbing Contractors: J. N. Knight & Son.
Panel Boards: Metropolitan Electric Mfg. Co.

McKim, Mead & White, Architects.

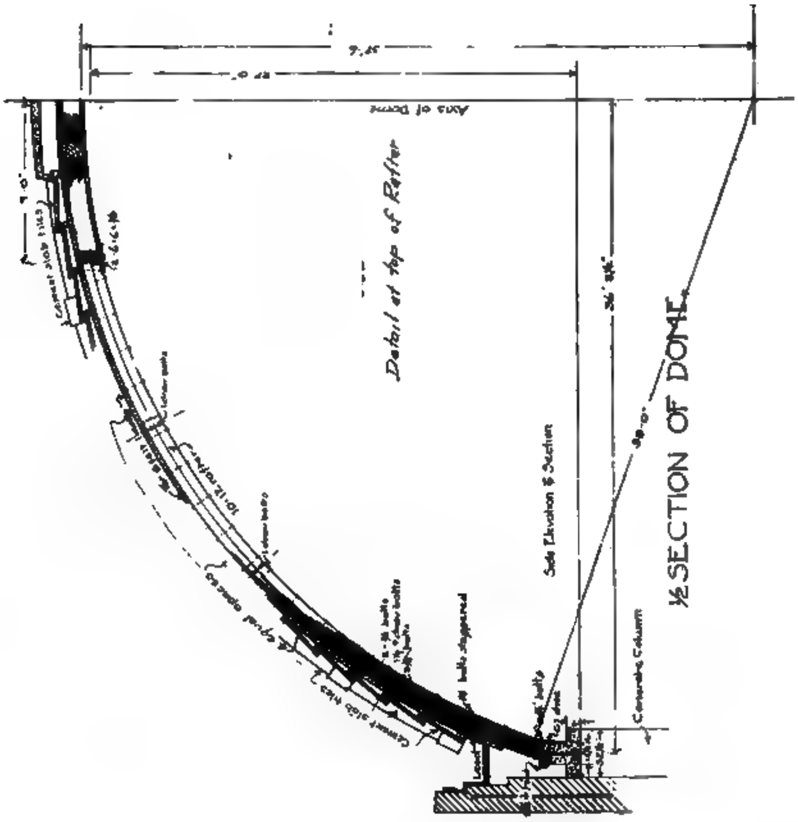
LINDEN BAPTIST CHURCH, CAMDEN, N. J.

ARTHUR TRUSCOTT ARNOLD H. MOSES
Associate Architects.

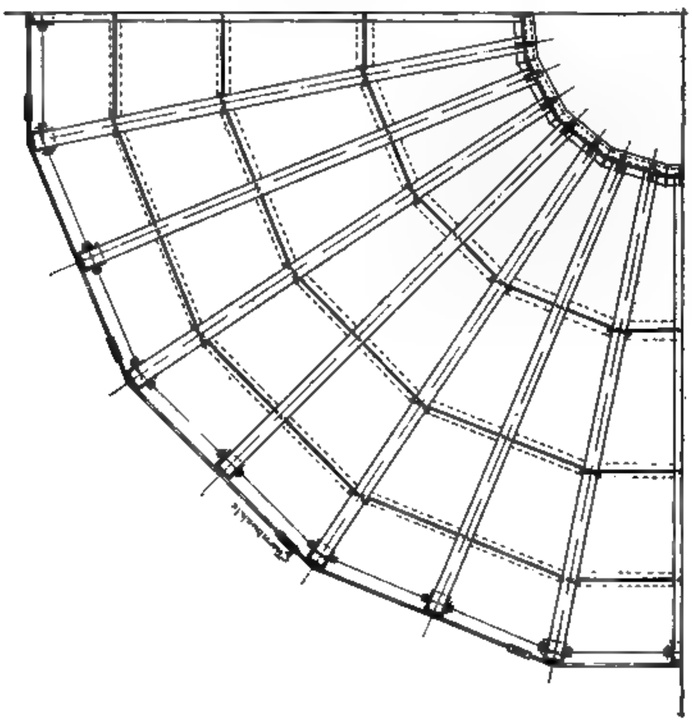
THE recently erected building for the Linden Baptist Church joins a large structure, known as the Bible school, which was built about six years ago and formerly used for all church purposes. This church building is rectangular in plan, 76 feet long on 9th Street by 88 feet deep on Linden Street, and has a seating capacity of about 600. The platform or rostrum is directly opposite the Linden Street entrance, while the choir and baptistry are on the left-hand side as one faces the rostrum.

The main feature of the building is the great dome covering the entire auditorium. This dome is supported by sixteen pillars, octagonal in plan, 32 feet in height, 32½ inches in their greatest diameter and built up of reinforced, poured concrete. The dome is 27 feet high from the springing line to the crown and has a radius of 36 feet 2½ inches, the diameter at the top of the columns being 72 feet 5 inches. The concrete slabs and the roof covering of the dome are carried on sixteen 10 by 12-inch curved rafters of wood, built up of 1-inch yellow pine boards, curved to the desired radius and maintained at that radius by ¾-inch bolts staggered throughout the rafter lengths. After the rafters were erected, three sets of draw-bolts, 1 inch in diameter for the two upper ones and 1¼

LINDEN BAPTIST CHURCH, CAMDEN, N. J.



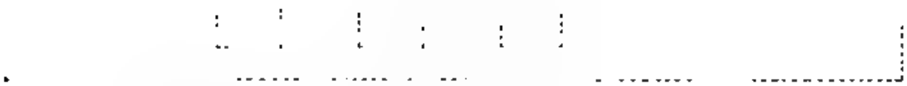
½ SECTION OF DOME.



¼ PLAN OF DOME

LINDEN BAPTIST CHURCH, CAMDEN, N. J.

Arthur Truscott } Associate Architects.
Arnold H. Moses }



L NDEN STREET ELEVAT ON

LINDEN BAPTIST CHURCH, CAMDEN, N. J.

Arthur Truscott }
Arnold H. Moses } Associate Architects.

inches for the lower ones, were placed through them, as shown in the accompanying detail drawings.

These curved rafters carrying the dome are supported at the base in a cast-iron shoe, bolted to a concrete ring resting on the sixteen columns. The construction of this shoe and of the concrete ring is also shown in the detail drawings. The thrust from the rafters was further taken up by means of tie-rods, 1¼ inches in diameter, placed at the back of the shoes, the tension being resisted by turnbuckles between each pair of rafters. At the head the rafters are bolted to a steel ring made up of 6 by 6 by ⅜-inch angle-irons. These angle-irons receive not only the ends of the rafters but the circular top structure of the dome, all of which is clearly indicated in the detail drawing. This method of building up the rafters proved entirely satisfactory; and when they were raised into position and subjected to tests, they were found to be perfectly rigid and to conform to the true curve.

On top of the rafters two thicknesses of 1-inch yellow pine boards were laid, the joints of which were carefully broken. These boards were laid straight with the ends butted against strips placed on the curved rafters. On these boards 2 by 3-inch cleats were nailed

LINDEN BAPTIST CHURCH—INTERIOR.

to hold the ends of the concrete slabs, and then the entire roof surface was covered with a three-ply layer of roofing felt, carried to the base of the dome and there cemented into the level surface of the roof, thus guarding against every possibility of leakage. On this roofing felt fifteen courses of concrete slabs were placed, 31 inches in width and 1¼ inches in thickness and varying in length from 77 to 33 inches. All these slabs and hip coverings were made on the premises and are composed of one part Portland cement, two parts bar sand and two parts of ¼-inch trap-rock. The materials were mixed quite wet and reinforcements of No. 26 expanded-metal, weighing about 2½ pounds to the square foot, were used; and in finishing the slabs a dryer of one part Edison cement and one part bar sand was sprinkled on and troweled in, great care being taken to have all the surface of the slabs well troweled and smoothly finished.

In laying the covering tiles, those at the base were laid first where there were two tiles between each section of the dome, the central joint over these being covered with a tile similar to that used over the rafters. The arrangement of the slabs and covering tiles is such that they frequently interlock at all joints and are, therefore, watertight.

The crown of the dome is covered with a concrete slab which was formed in place and which is about 10 feet in diameter.

The interior surface of the dome is coffered or finished in large sunk panels, false ribs being placed between the rafters and being of the same general dimensions as those of the rafters themselves. The inner surface is covered with slow-burning plaster-board, while the ribs and rafters are covered with poplar boards. The entire interior of the dome is finished in white-lead paint with gold decorations. Below the dome, the walls are painted in ivory white, lightly decorated with gold.

The seating throughout is in antique oak with a dull green finish.

A rather unique method of electric lighting is used, the lights being enclosed in large glass balls suspended from the dome and the ring underneath.

The six large windows on the street fronts in the south and west walls are filled with white glass in Roman lattice lead-work. In this field of white glass are set designs in color, symbolizing the history of the world and the Church, beginning with the Creation and the Fall and ending with the Church Triumphant, or the New Jerusalem. The motifs for the designs are found in the events of God's dealings with His people in the Old and New Covenant. Eden, the Flood, Melchizedek, Abraham, the Sojourn in Egypt, the Judges, the Prophets and the Kings furnish themes from the Old; and the Life of Christ, His birth, miracles, crucifixion and resurrection, the Early Church, the Apostles and the New Jerusalem, themes from the New.

The five apse windows are filled with designs, the predominating motifs being the vine and the rose surrounding the Cross, with the Candlesticks of Revelation.

THE HOLLOW-TILE FIREPROOF HOUSE

ARTICLE VI.

By FREDERICK SQUIRES.

AS may be noticed from the character of the illustrations, the object of this article is to go into more minute detail than was possible in the last issue about the surface effect of the "Texture-Tile" wall and the practical methods of obtaining it. A few words will then be added on the subject of more complete fireproofing.

The first picture is a detail of the porch side of the Lyon house, which was illustrated in the last article. It is noteworthy that the texture of the wall holds its own with the little evergreen plants—the most velvety kind of foliage. The combination of colors, old rose and dark green, is mutually advantageous. The picture shows the variation in color of adjoining blocks which could not be more happily obtained if the blocks were carefully selected instead of being used as they happened to come. There is, to the pictured wall, a velvet surface from the millions of tiny shades and shadows cast by the roughened faces of the blocks. The wide, uneven joints made with cement and cinders, are in character with the wall, and their gray color does not mark off the units too sharply.

The tail-piece of this article shows a good piece of brick work of the same description—which suffers, however, by the minuteness of its units. It takes a sharp eye to trace out the delicate brick bond and bands. Yet this kind of a surface is a step in the right direction. The rough slate roof is in better scale than the brick work.

The picture of the inner porch wall of the Lyon house does not do justice to the charm of the reality. Its color reminds one of a Royal Bokhara rug, and the appearance of the surface

THE PORCH OF THE LYON HOUSE. A WALL LIKE A ROYAL BOKHARA RUG.

varies from that of the rug only in the rough gray mortar joints. Below is a good piece of brick work, which, however, falls short of the wine-like richness of the "Texture-Tile." The brick is as long as the tile, but not so high.

The working drawings which follow are given to explain the easiest ways of obtaining a good "Texture-Tile" building. The plan shows the proper position of the facing and backing, and is figured to tile sizes. A setting plan should accompany it, showing the exact number of tiles and which ones are omitted for door and window openings, which are always in tile dimensions. The elevations showed the exact number of tiles in the building, but the setting plan proved of greater service on the job.

There has grown up under the name of "the fireproof house," a method of construction which is no better than the old brick or stone house of fifty years ago, and it is not fireproof at all. This is the terra-cotta tile house with wood floors. Wood floor construction costs ten cents a square foot, and fireproof floors about thirty. This means that a two-story house with fifteen hundred square feet of area per floor, could be adequately protected

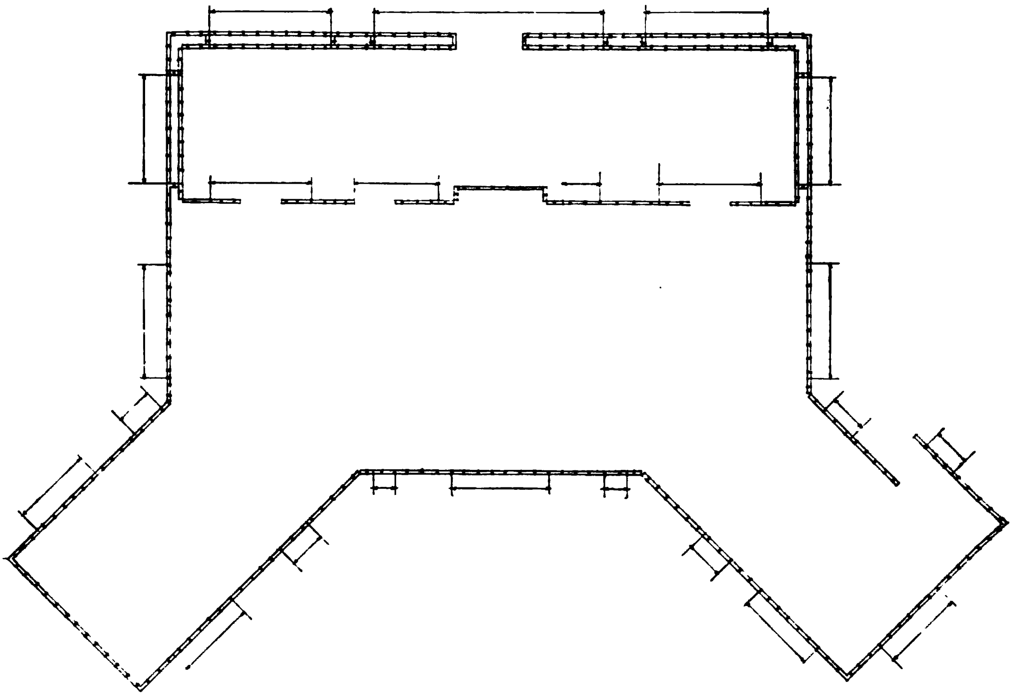
THIS BRICK IS AS LONG AS A "TEXTILE-TILE" AND HAS THE SAME SURFACE.

FRONT ELEVATION OF THE HORACE LYON HOUSE.
Frederick Squires, Architect.

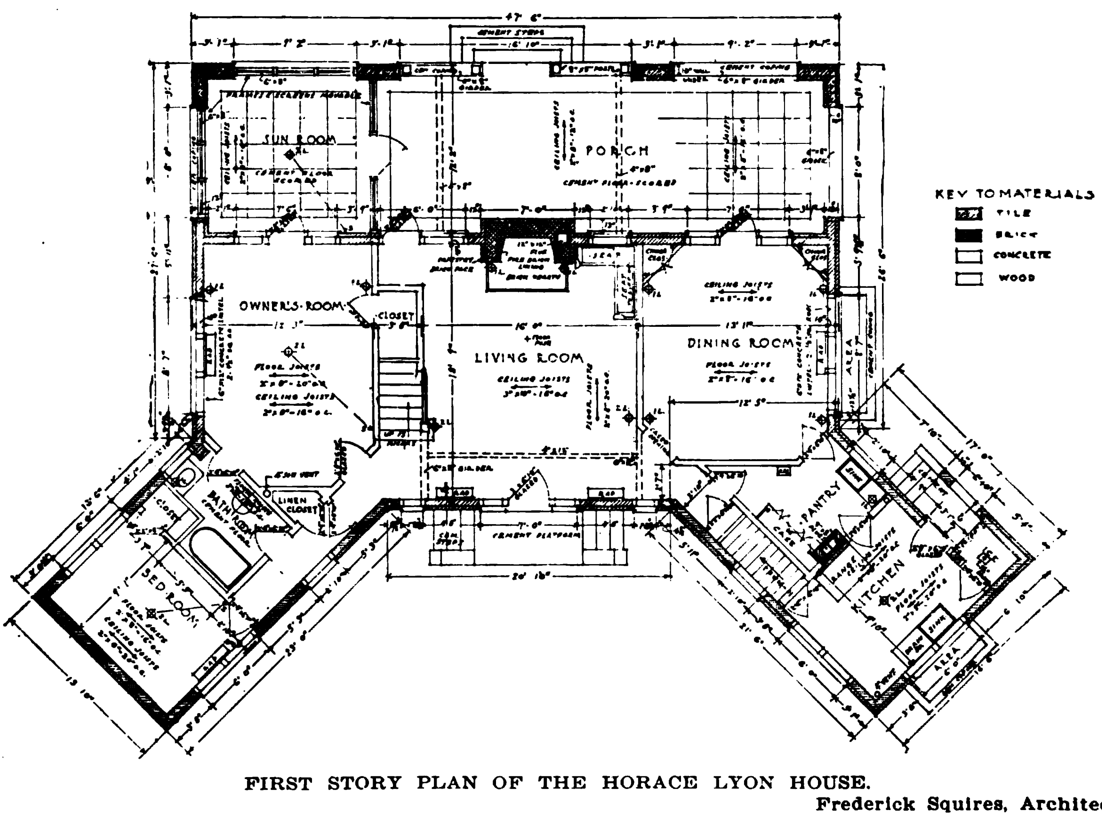
on the first and second stories for an additional expense of $600 over the expense of wood construction. In order to make any really permanent advance, such masonry floors are absolutely necessary. A masonry roof is a little too much to expect of the rank and file at this stage of the game. It must be nearly flat, and flat-roof designs are not yet popular. This is so true that a designer will draw a roof in elevation even when he knows that it will not show in perspective. But if we can get a building, only the roof of which can burn, we have taken a long step in advance. Some powerful designer ought to work out and, by its beauty, popularize the flat-roof type. Some day this will be done.

Ex-Fire Chief Croker, in a recent talk before the Gargoyle Club, said that during last year the value of property destroyed by fire was equal to the cost of new building. This is a terrifying fact. That the entire efforts of all the builders in the United States were set at naught by the short-sightedness of their methods is reason enough for all to stop and take account of stock. Recently a

REVERSE ELEVATION OF THE HORACE LYON HOUSE.



SETTING PLAN FOR THE "TEXTURE-TILE."



FIRST STORY PLAN OF THE HORACE LYON HOUSE.

Frederick Squires, Architect.

rich American brought back with him from Japan the entire contents of a Japanese room. He had no sooner prepared an appropriate setting for these art treasures in his own house than the entire place was burned to the ground. No insurance adjuster, however fair, can repay that man for his loss.

The problem of reducing the cost of a masonry floor for a house to its lowest terms has not yet been solved in practice. The concrete beam and tile construction is not the cheapest method because the tile is but a filler to give depth to the beam, and after the beam is cast it is useful only to give a surface for plastering. This tile filler, because it must be a rectangle, ties the construction up to two forms—beams running in one direction, or in two directions at right angles to each other.

Too much emphasis has been placed on obtaining a flat surface for plastering. Either the expensive and otherwise useless tile block is required, or when plastering is to go directly on concrete, the aggregate for the concrete must be cinders, a very questionable material for constructive purposes. That such indirect methods should be used in the interests of plaster presupposes that plaster is the most desirable material to expose for a ceiling. This was true up to a recent date, but it is not now the case. Concrete has been so far perfected that its appearance is better than plaster. Compare a plaster cast from a model in high relief with its duplicate in concrete. The plaster by comparison is cold and cheap. It lacks the color, the texture, and even the appearance of solidity which are present in a high degree in the concrete image. Architects have gone so far as to leave off the hard finishing coat of plaster and roughen with sand the final coat in order to get away from the staring dead white surface of common plaster; when not roughened, plaster must be tinted. All this shows that the appearance of plain-finished plaster work is unsatisfactory. The same is true when the comparison is made in larger surfaces than the cast.

When the question of elaborating the architectural effect of the six surfaces of a room is considered, it is usually the ceiling which receives the most attention. This is true alike in the public building—as witness the ceilings of the New Theatre, the New York Public Library, and the waiting room of the Pennsylvania station—in the city house and in the country house. It is an accepted principle of design and decoration. The designer of the public work may execute his ceiling in stone, the city mansion designer in plaster

TYPICAL WALL SECTION OF THE HORACE LYON HOUSE.

or carved wood and color, and the country-house architect in moulded wood beams, but each in his own way puts the greatest emphasis of his interior on the ceiling. This is true now, and it has always been true.

With the use of the light-colored cements, concrete has advanced rapidly in beauty. Since concrete is a combination of cement, sand, and stone, there is no difficulty in obtaining the appearance of certain natural stones, say marble, for example, by mixing broken or powdered marble with cement and sand. Beautiful reproductions of marble statuary in concrete are results obtained every day. The difference in cost between the operations of pouring a liquid into a mold, and cutting the same outline out of a block of stone is responsible for much of the present-day activity along these lines. Most lovely colors are easily obtained. The surface is dull and gives a chance for a display of the softest tones.

It is with concrete—a material which may display beautiful stone as a part of itself—which may be so mixed as to obtain beautiful colors, and which best of all will take the form of any mold, however elaborate—that we are going to aid the fireproofing of the country house.

There will be described in a later article a recent invention in floor construction which involves the decoration of the ceiling and the casting of the constructive floor in the same operation, and which will serve to reduce the cost and beautify the fireproof house.

In closing this article it may be said that the time should be past when builders spend their whole efforts and other people's money in a fight to build houses as fast as they burn. The terra-cotta house is doing a real service to the country only when it is, or tends toward, greater fireproofness and permanency. To do this, we have succeeded in perfecting a wall construction and should now turn our minds, artistic and practical and inventive, toward perfection and economy in floor and roof construction. Meanwhile, let us try to build our outside walls, already fireproof, with better art.

(To be continued.)

AN EXAMPLE OF TEXTURE IN BRICK WORK.

STUDENTS' DETAILS OF CONSTRUCTION

Architectural Department, University of Pennsylvania

IN the June and September, 1911, numbers of Architecture and Building, some examples of students' work in architectural construction at the University of Pennsylvania were published and attention was called in a short article accompanying those drawings in the June issue to the correlation of design and construction in the schools of architecture of the United States and other countries. There is a constantly increasing tendency to emphasize the interdependence of design and construction and we are enabled to still further illustrate this fact by publishing more examples of the work of the schools selected from a great number of problems.

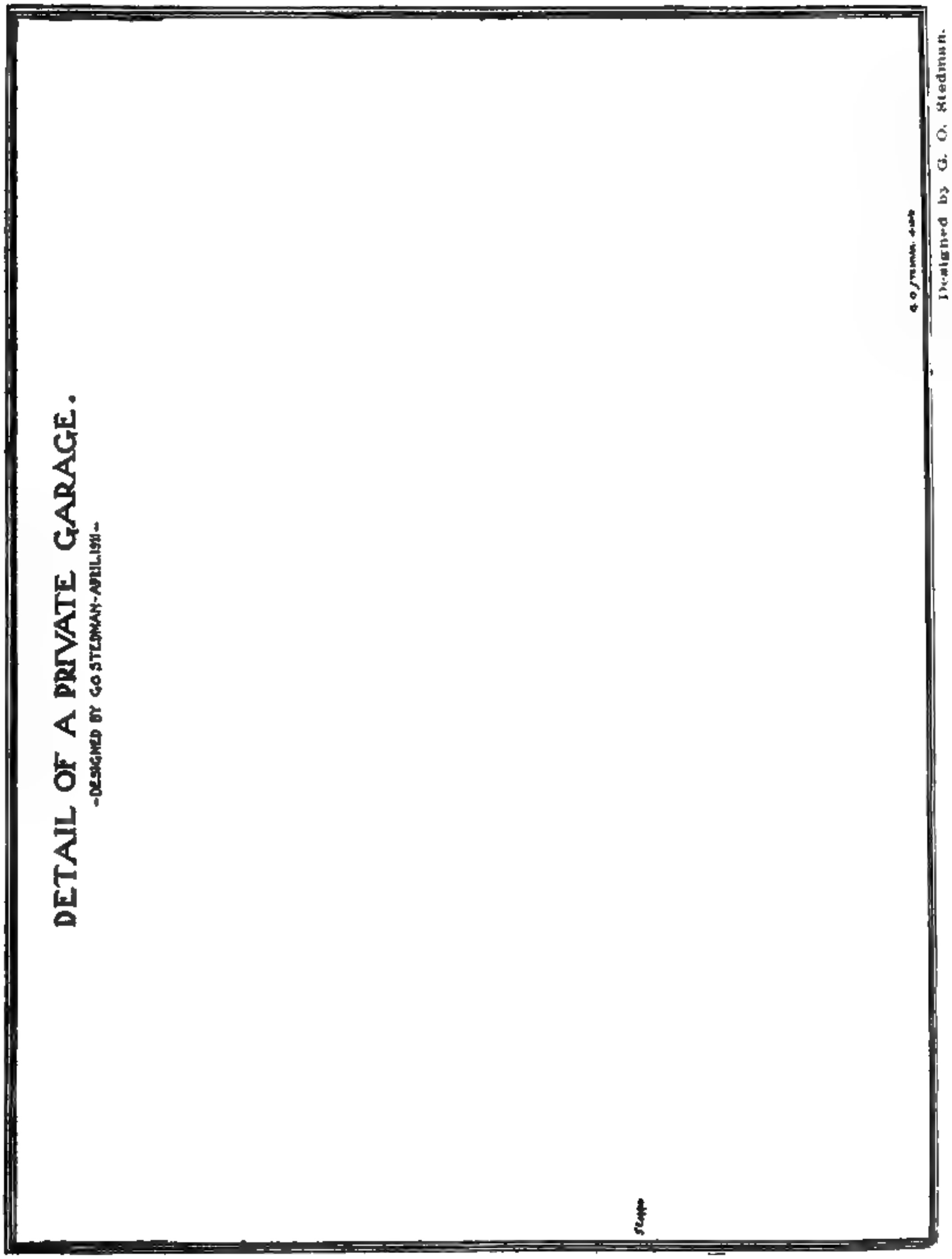
In a paper by Mr. Beresford Pite, F. R. I. B. A., recently read before the London Architectural Association School, on "Building Construction as a Features of Architectural Education," Mr. Pite says "The history of architecture is that of building construction, the means being involved in the consideration of the end attained. The two elements of architecture, the purport of the building, which involves the civilization of the race, and the aesthetic ideal and traditions of builders, both finding embodied expression in construction. A genuine architecture has neither of these two elements singly, as it cannot be without purpose or beauty; but it involves their combination under the conditions of the science of building, and, despite the tendency of books of modern architectural history to concentrate attention on religious, civic, or domestic habit, or upon a commerce in traditional architectural forms, the building construction of man in different countries, and ages, is the field of the true study of architectural history."

There is no doubt of the constant increase in the amount of recognition given to the working out of the design and the construction at the same time. It is acknowledged that courses in architectural construction in the schools of architecture are of the greatest value when it is possible to take up with them some of the problems of design which lend themselves more readily to this treatment, and actually construct the work on paper as nearly as possible as it will be built.

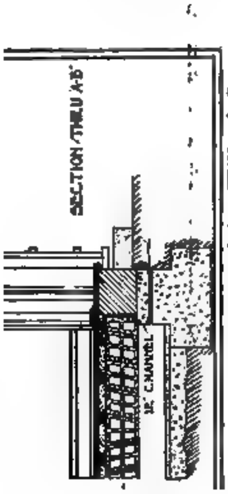
For example, in the school of architecture at the University of Pennsylvania, in Philadelphia, in the course in building construction which continues through two years, all students, in addition to the lectures, quizzes and ordinary drawings in the elements of the subject, are required to do from two to four problems during the year in applying the principles of architectural construction to those problems in design which they have already completed.

The subjects published in this issue are a private garage, built in reinforced concrete—two designs by different men—and a suburban hospital. The problem stated in regard to the garage, that it was to be erected on the rear part of a suburban lot and approached from the front street by a driveway. It was to be a concrete building, and the design was to be appropriate to that material.

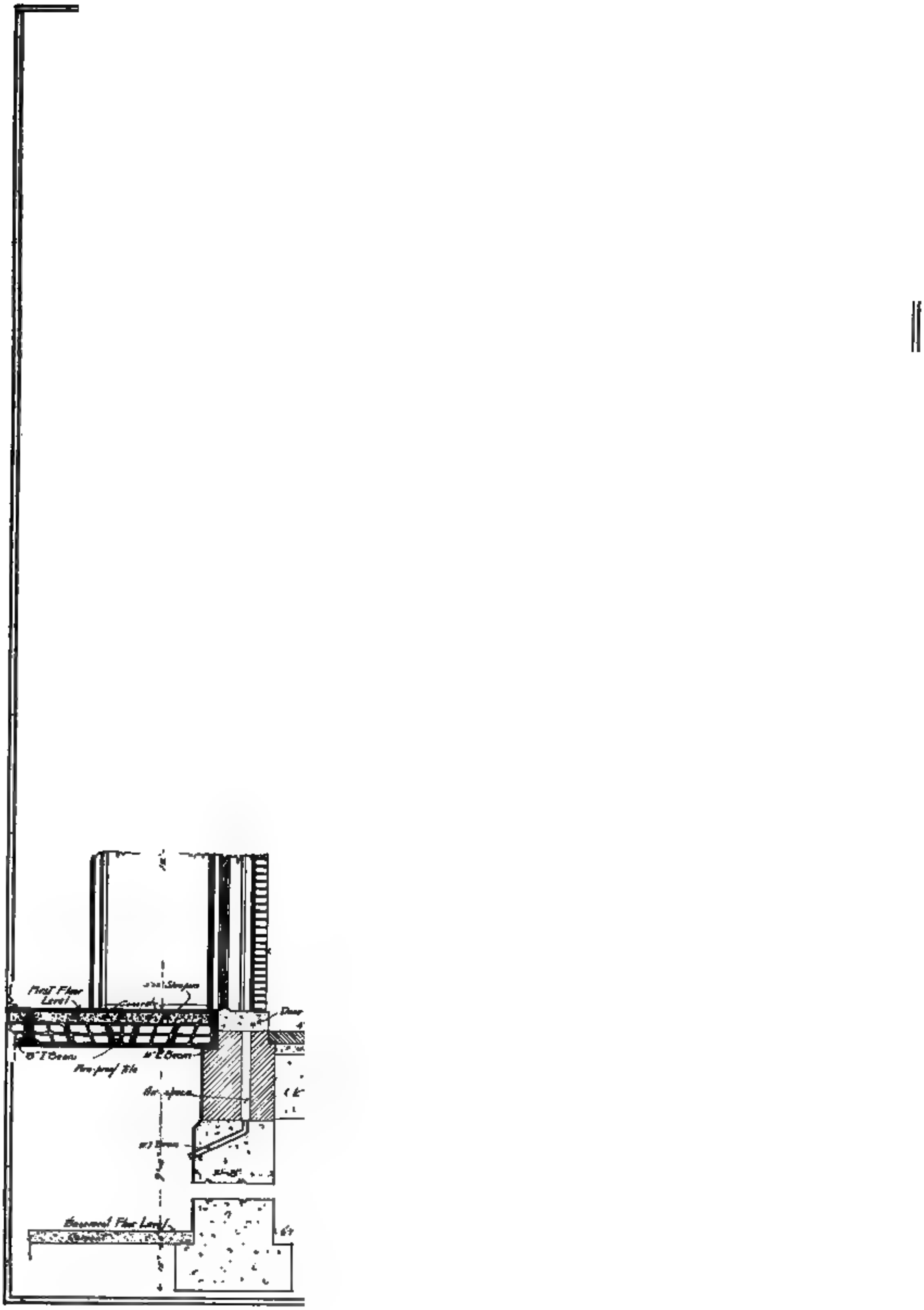
The suburban hospital, which is illustrated on the second page in this number, was to be designed for a small community and was to accommodate 32 patients in public wards and 8 patients in private rooms.



Designed by G. O. Stedman.



Designed by Willard See.



Designed by Lewis B. Walton.

SWISS CHALET DESIGN

V.

By WM. S. B. DANA, B. S.

THE châlet interior is determined by its exterior. Four walls, running from excavation to roof-line, and capped by a shallow, double-pitched roof —these when viewed from within constitute its *sine qua non*. The space thus included is generally partitioned off by one or more cross-walls locking together one of the pairs of enclosing walls, as in Fig. 29. The natural (tripartite) vertical division of the interior, like that for all dwelling interiors, — that is, the earth portion: its other extreme, the roof: and, thirdly, the space between them—determines the character of the employment to which these portions are to be assigned. When these natural divisions are more definitely marked and determined by *floors*, the structural interior becomes still more affected, as in Fig. 30. The assignment of stories corresponds closely to that in America; that is, the cellar (*Kellar, cave*) is given the storage, heating and rough work; the first floor (*rez-de-chaussez, Parterre*) is given the business of the daily life, the social business, and the like; the second floor (*première étage, erste Stock*) is devoted to sleeping chambers; and the roof story (*Dach Stock, comble*) is given up to retirement, storage, etc.

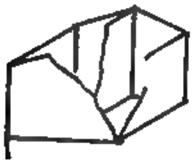


Fig. 29

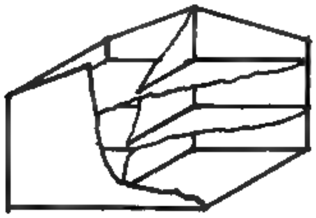


Fig. 30.

The resultant "compartmented" structure must be next provided with a means of connection between the interior and the outer world, at a point near the ground; likewise, similar means of communication between the stories and the entrance. In the Swiss châlet, this system of communication, or circulation, is placed at one of the rear corners, the entrance being generally at the side, though occasionally at the rear—almost never at the front.

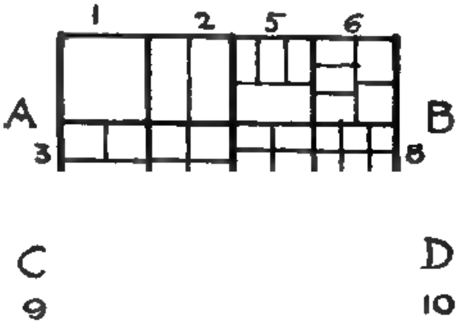


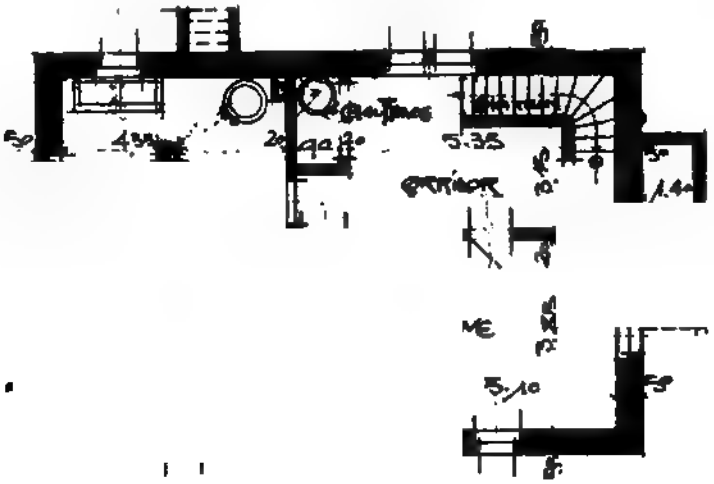
Fig. 31.

The characteristic assignment of the rear half of the main floor (sometimes, front) is to entrance, hall, stairs (up and down) toilet, and kitchen; the other half is assigned to reception and dining rooms.

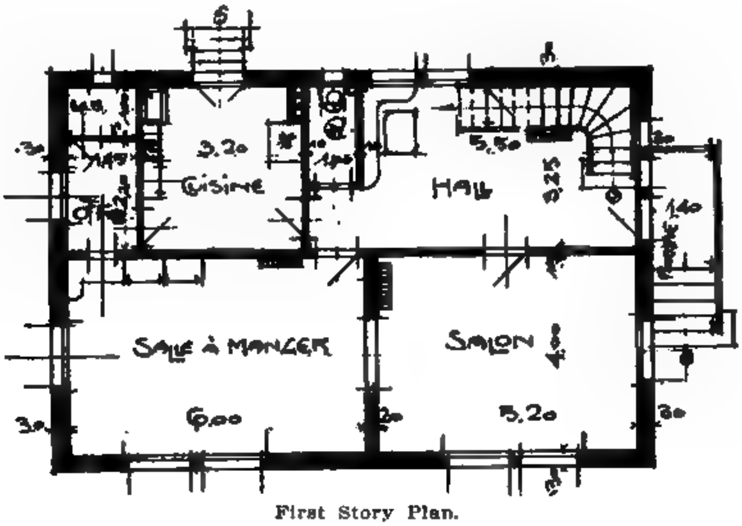
A scientific basis for the study of the various floor plans cannot fail to be of assistance; for that purpose the following diagram, Fig. 31, is presented. A square about 2 inches on a side is divided into four squares, A, B, C; A is divided again into four square, and B likewise; these eight smaller squares and the two larger ones, C and D, are to be considered as miniature floor plans, being divided progressively and logically from 1 to 10. These ten may serve as types to which may be referred any of the châlet

plans which are given on the succeeding pages.

An example of 1 may be seen in the plan of the summer house on page 655 of the December number; this plan with its porch is an example of 2. A number of examples, or slight modifications thereof, of 4, 5, 6, 7, may be noted.



Cellar Plan.

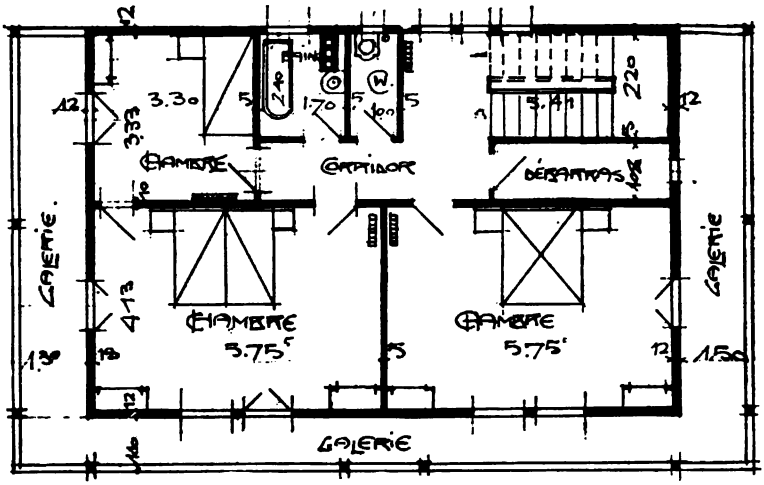


First Story Plan.

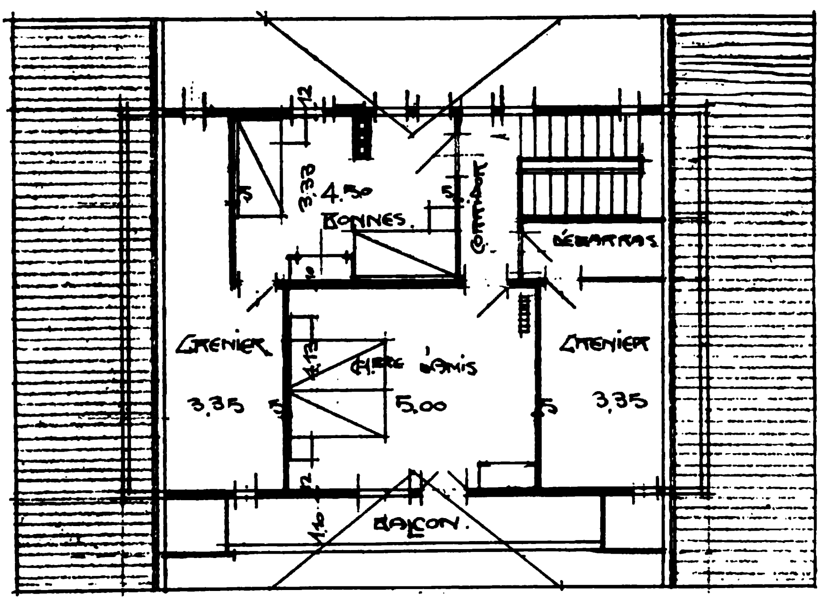
We could hardly do better at this point to show the results of these investigations of the elemental rules for châlet interior disposition and floor planning, than to present the four floor arrangements of an actual châlet. This is made possible to a most gratifying degree, through the courtesy of Spring Frères of Geneva, Switzerland, whose plans for the châlet of M. Chatelanat at Lausanne we are thus able to present. The disposition of the plan is a little unusual in that the long side faces the front. It will be seen that the "husk" at the earth story (from cellar bottom to under side of main floor) is of stone 50 centimeters thick, or a trifle less than 20 inches; at the main story it is of stone a foot thick, and at the upper

story and roof story between 4½ inches and 5 inches.

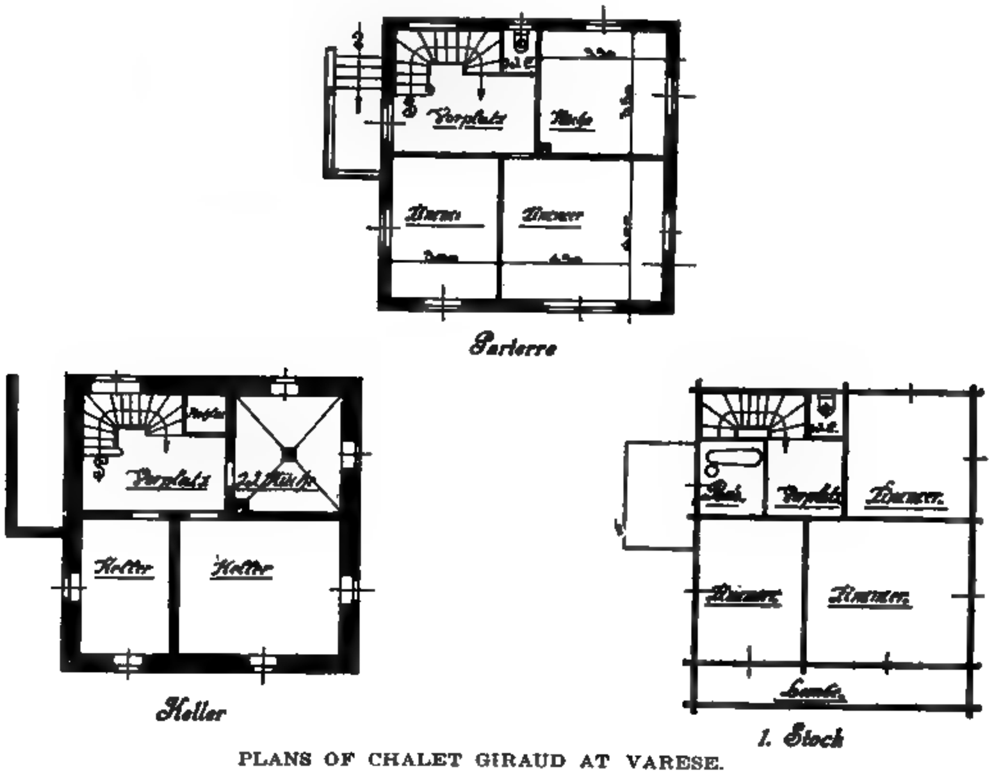
The cross-wall running from left to right, from cellar to roof, is approximately 8 inches thick at the earth story, 6 inches in the main story, and 4 inches in the remaining stories. The floor plans, as a result of this cross-wall, are brought under classes 3, 4 and 5 of our diagram, Fig. 31, though No. 4 practically covers the case, each floor being divided into four corner spaces, or rooms. The communication between the four floors, or stories, and the entrance way, is provided for in one corner of the plans, the stairs occupying the extreme corner, and the communicating hallways the remaining portion of this section; the main point of



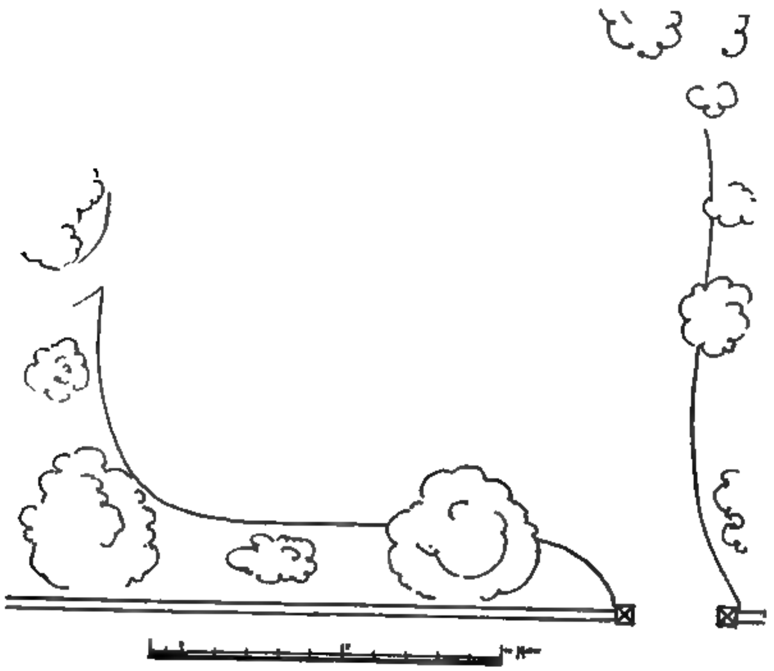
Second Story Plan.



Attic Story Plan.



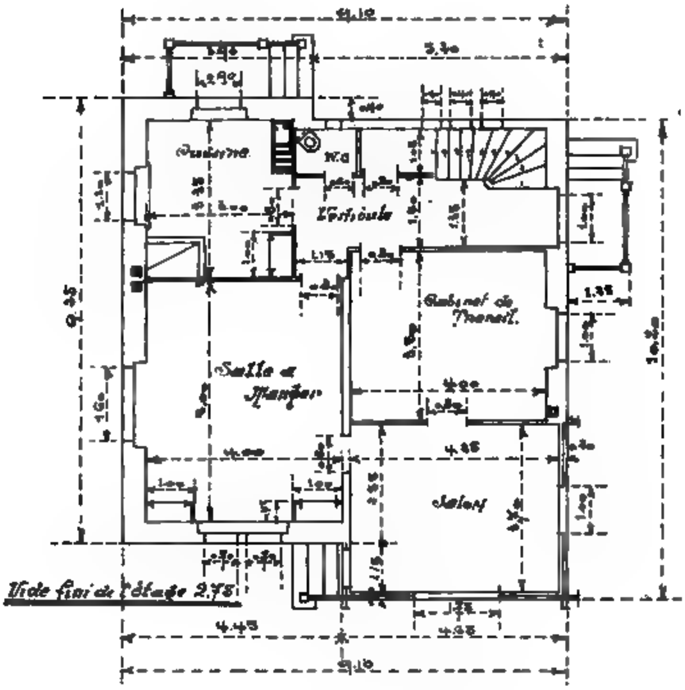
PLANS OF CHALET GIRAUD AT VARESE.



CHALET BERNARDINA NEAR VEVEY.

Parquet & Châlet Fabrik, Interlaken.

Front Elevation.



Main Floor.

CHALET AT GENEVA.

Ody & Co., Geneva.

A ZURICH CHALET PROJECT.

Jacq. Gros, Archt.

entry is at the center of the right-hand wall. A secondary entrance is into the kitchen at the rear. The division of the front half of the interior is maintained upward through three stories, thus providing for its double treatment, and the double treatment of its façade. At the top, this becomes triple, with a large guest chamber at the center and a narrow store room at either side. The main balcony is at the bedroom floor and encircles the building, except at the rear; it comes well within the protecting line of the gable at the front and the eaves at the sides. The balcony is supported on posts and brackets at the right wall, and by brackets at the other two walls. The balcony at the front of the roof story is supported by posts from the story below. The only remaining external structure is that of the entrance porch steps at the right-side wall.

The plumbing and heating systems are located at the middle of the rear wall next to the kitchen and furnace chimney, with circulation to the right and front of them. The near portion of the stairwell, in the two upper stories becomes closet and storeroom space.

Unique features of the main floor are the window and wall seat, and table, at the inner corner of the hall; the toilet, and in the extreme left-hand corner, the *débarras,* or closet, and "office." The only objection to this arrangement would seem to be that the kitchen is not allowed sufficient lighting. The bedroom floor offers no unusual features, except, perhaps, the absence of closets, their place being taken by wardrobes; the presence of square cabinets at the head of each bed is characteristic of all continental bedrooms. The communication of the three bedrooms with the balcony is by casement doors, as indicated. In the roof story, the servant's room is shown at the rear.

(*To be continued.*)

A BERNESE CHALET.

LOFT IN THE SCHLEGEL BUILDING, NEW YORK.
Showing Automatic Sprinkler Equipment, With Exposed Pipe Suitable For Such A Structure.

SALESROOM IN THE COLGATE OFFICE BUILDING, JERSEY CITY, N. J.
Showing How An Open Pipe System May Be Submerged So As Not To Injure The Decorative Effect.

AUTOMATIC SPRINKLER EQUIPMENT OF LOFT BUILDINGS

ARTICLE I.

By E. P. Boone.

DURING the last five years much has been said about the enormous fire loss in this country. Efforts have been redoubled in that period in a vain attempt to check the fire demon. Yet he seems to roll up a rich harvest each year in spite of all that is said, and that is being done by the way of fire-prevention and extinguishment.

The architect has given of his time liberally in the study of the subject, and has made effort, notably in city buildings, to combine safe and sane features with those artistic and ornamental. He has not only learned of the relative values of concrete and hollow-tile, but of fire-doors and wired-glass windows, metal trim, etc., and he has in many instances succeeded in having a building erected that was as near fireproof as a building could be before being tenanted. But with all his study, so far as I have been able to observe, little attention has been given to the protection of the contents against fire, until only within the last two years. The building may be of rugged, fireproof construction, with all horizontal and vertical openings properly protected, but when it is filled up with combustible contents, it presents a condition not unlike the old fashioned wood-burning stove, for when once the fire is well kindled, it will not only consume everything within, and attack the weakest part in the building construction, but it will also give off heat in a sufficient degree to ignite the contents of surrounding buildings. Perhaps this lack of attention to the protection of the contents may be a lack of knowledge; or possibly the thought that any automatic system of fire-protection, as, for example, automatic sprinklers, placed on the ceilings, would ruin the appearance of the building, deters them. Injury to the decorations, the lighting effects, the causing of shadows and otherwise, it is their fear, would not enhance the value of the building from the investment standpoint; and when it came to having these so considered unsightly pipes containing water under pressure distributed on the ceiling, many were and now are the objections raised by the architect. Owing to what he considers a great danger: the possibility of a leak in the pipe somewhere, which sooner or later will flood the building, causing irreparable damage, raises another objection in the mind of the architect.

It is to be admitted that it is only within the last few years that the automatic sprinkler has sprung into prominence. After every great fire something has been said in the press about automatic sprinkler systems, but it is only recently that they have been given public recognition. It is to give the architect some idea of the value of an automatic sprinkler system, and the desirability of preparing the building to receive this form of protection, as well as to give a general interpretation of rules governing an installation, that this paper has been prepared.

Many attempts were made prior to 1870 to invent an automatic sprinkler head having a commercial value. Numerous systems of perforated pipes and rose sprinklers had been installed, but it was not until the Parmalee sprinkler was placed on the market (about 1874) that there was an automatic sprinkler head of commercial value in this country.

During the years from 1880 to 1885

THIS IS THE MAIN FLOOR OF THE McCREERY STORE, NEW YORK.

An Example Of A Sprinkled Risk With A Concealed Pipe System. The Automatic Sprinkler Heads Are Inverted And Just Come Through The Ceiling. They Are Unnoticeable And Do Not Detract From The Decorations.

McKim, Mead & White, Architects.

inclusive, several types of automatic sprinklers were placed on the market, including the Barnes, Brown, Burritt, Bishop, Buell, Gray and the early forms of Grinnell, all of which are now practically obsolete. The Buell sprinkler was one of the first types not having the solder exposed to the water. It was a common defect among the early sprinkler heads to have the solder exposed to the water, so that in many instances at the time of a fire the head would resolder, due to the water trickling out and reaching the solder before it was entirely fused. This cannot happen with any of the present day, approved automatic sprinkler heads, of which there are eleven.

From 1882 to 1885 the introduction of automatic sprinklers was slow, and from all accounts they were not favored either by the insured, who were ever mindful of the possibilities of water damage, or by certain insurance companies for obvious reasons. To-day, however, one rarely hears of an objection on account of the possibilities of leakage, for the types of heads employed are guaranteed tight under 300 pounds pressure, and the insurance companies welcome their introduction and grant most liberal reductions in insurance rates.

In certain municipalities automatic sprinklers are required by law, as in certain portions of theatres and other houses of amusement, school houses, inaccessible basements, and in buildings of poor construction and hazardous occupancy in congested localities. Their introduction is not now confined to manufacturing establishments, but has extended to mercantile and loft buildings.

(*To be continued.*)

THE PACKARD SCHOOL, 35TH STREET AND LEXINGTON AVENUE, NEW YORK.

Builders: Hedden Construction Co. Henry F. Ballantyne, Architect.
Otis Elevators.
Plumbing Contractor: W. G. Cornell Co.
Metal Lath: Arthur Greenfield, Inc.
Star Expansion Bolts Used.

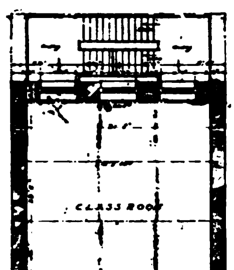
THE PACKARD COMMERCIAL SCHOOL

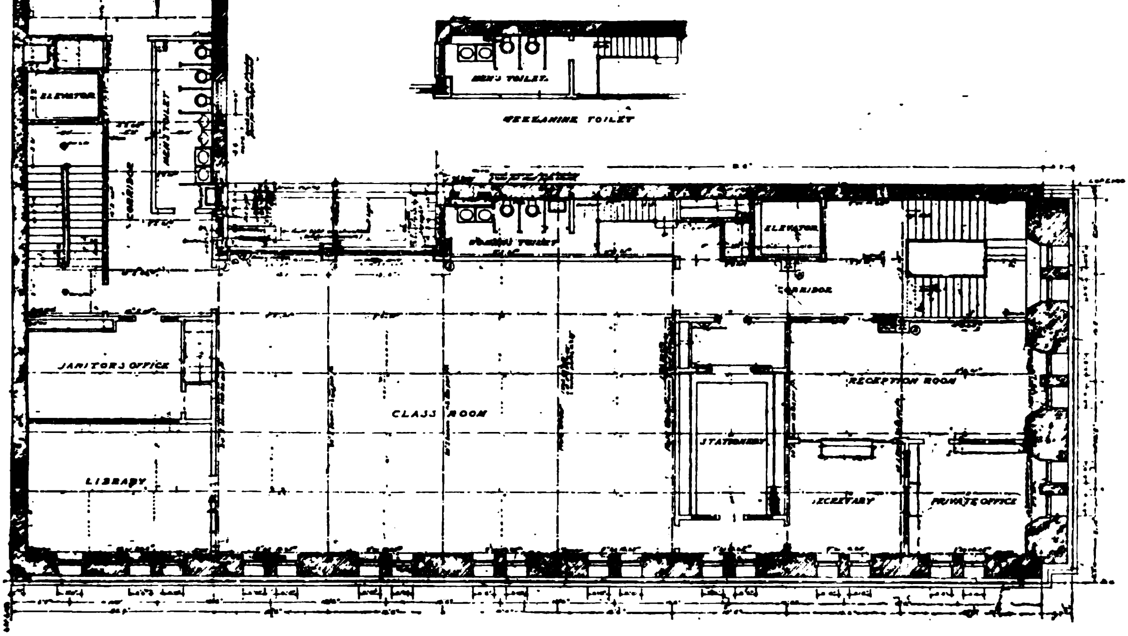
H. F. BALLANTYNE, Architect.

THE new building for the Packard Commercial School is located on the corner of Lexington Avenue and 35th Street, on a lot approximately 47 by 125 feet, with an extension about 25 by 42 feet on 35th Street. The purpose of the building is to provide suitable light, spacious class rooms for the school, together with a series of stores on the first floor. It is of the utmost importance that such a building should not only be perfectly light and express on the façade its scholastic character, but it should also be of such a monumental character as is consistent with the age and dignity of the institution which it houses.

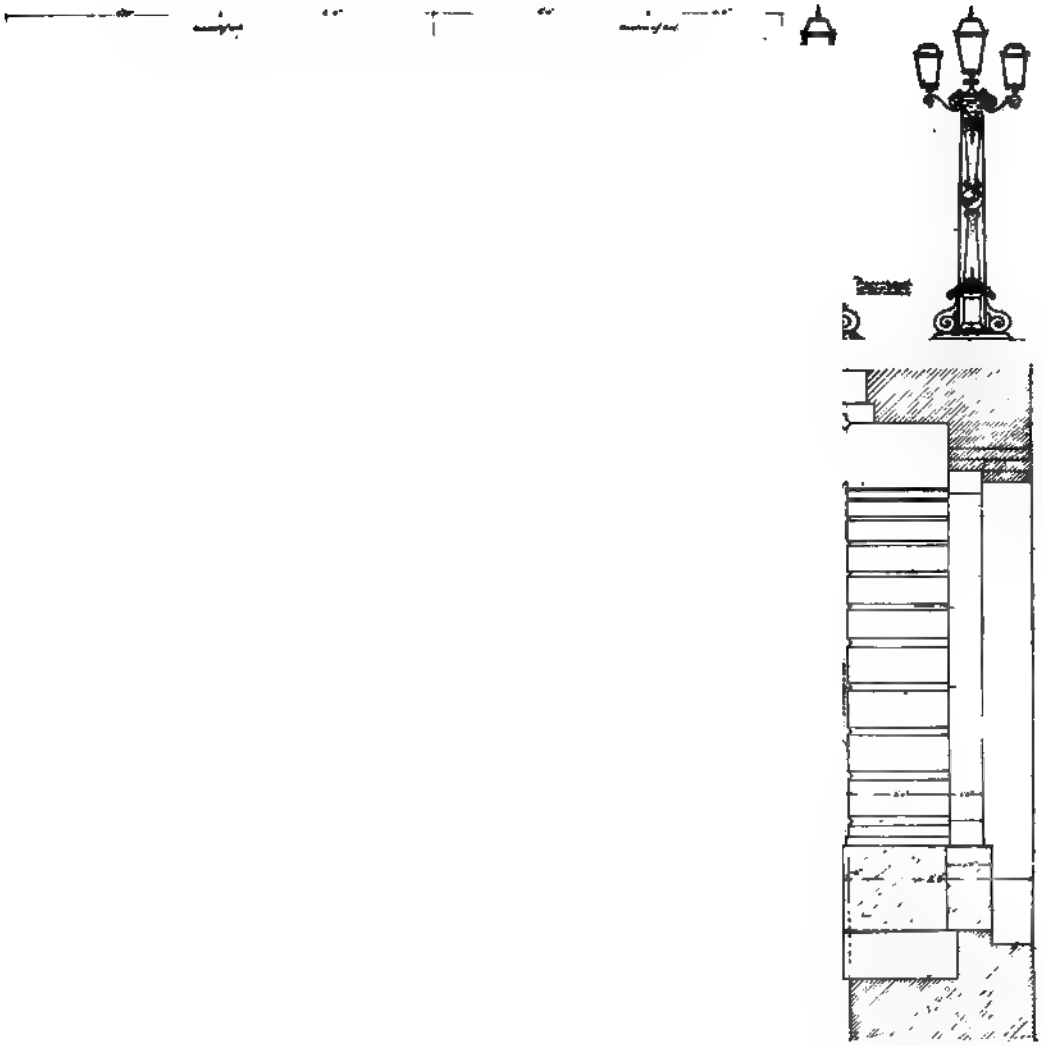
The style of the building might be described as Georgian, or rather a modern adaptation of that early American style sometimes called Colonial.

The most satisfactory and monumental way of obtaining the greatest possible light is by a columnar treatment, the interstices between the columns or pilasters being filled with an iron frame work, which by its contrasting color counts rather with the windows than with the masonry of the pilasters. The 35th Street façade of the school portion of the building is therefore treated with strong brick pilasters, which become columns of stone upon the Lexington Avenue front. These





SECOND STORY PLAN. THE PACKARD COMMERCIAL SCHOOL.
H. F. Ballantyne, Architect.



DETAIL OF STONE WORK AND IRON WORK AT ENTRANCE. THE PACKARD COMMERCIAL SCHOOL.

H F. Ballantyne, Architect.

columns are engaged or connected with the wall so that, while retaining their dignity, there is no sacrifice of light.

The first story, containing the stores, is treated as a massive arcade, heavily rusticated, and of great depth of reveal, providing ample support for the columns above, and yet giving an abundance of light to the stores. The fifth floor, above the colonnade, is treated as an attic, pierced with triple windows over each bay. The lower portion of the building, the columns and entablature are of hand-cut Indiana limestone, and the jambs and trim of the entrance doors, together with the base of the building, are of semi-polished Green River granite, which is practically the same in color as the limestone, but which from its hardness and finish prevents the discoloration which would occur at these points, should limestone have been used throughout.

There are two main entrances to the building, one upon Lexington Avenue and one upon the eastern end of the 35th Street façade; two elevators and wide marble stairways which give access to the class rooms above by marble walled corridors.

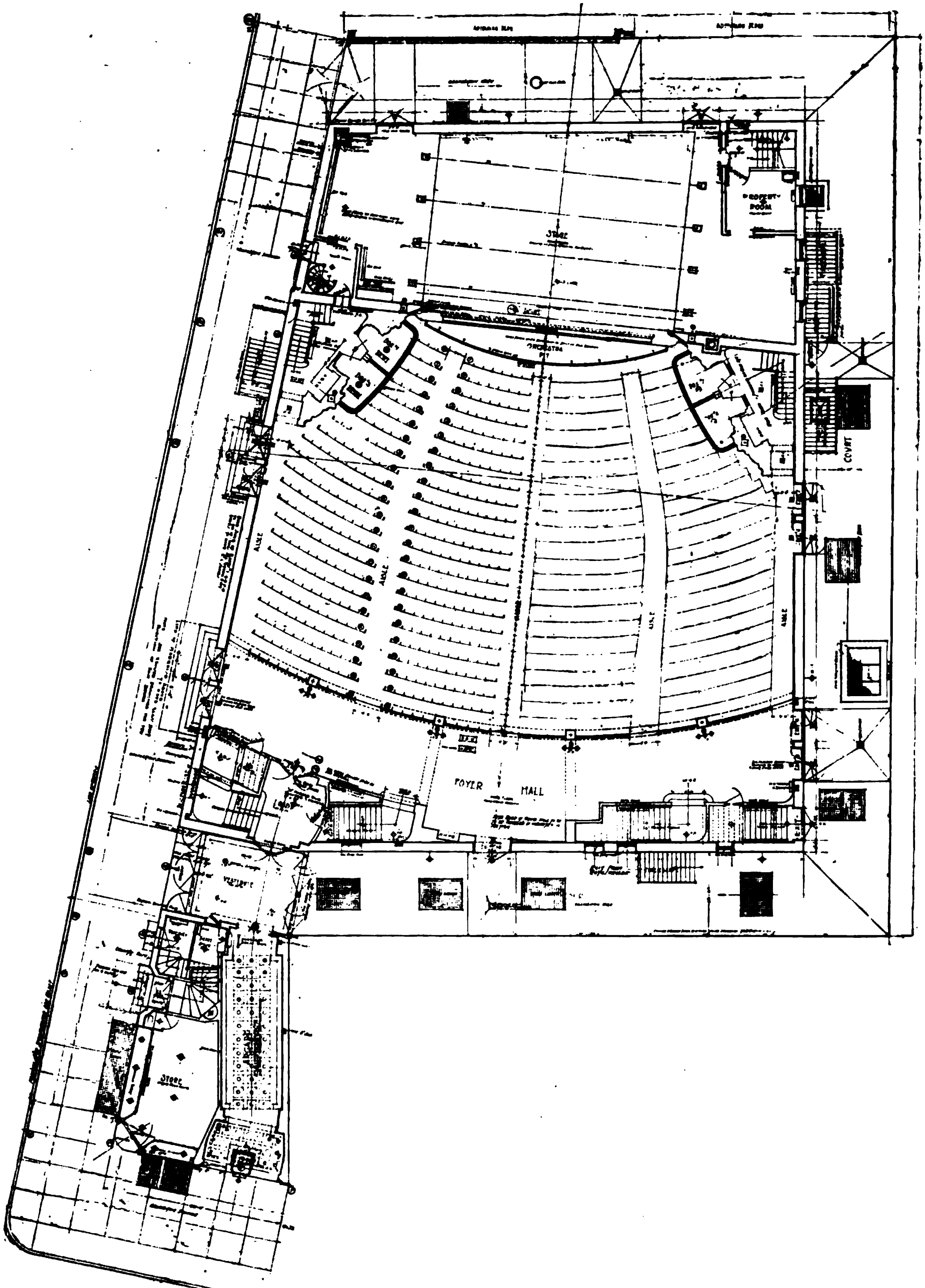
The space on the first story not taken by the entrances is divided into four stores with a floor space of about 1,100 square feet each, except the end store on 35th Street, which contains about 1,500 square feet. These stores are well-lighted and have large basements provided with separate sidewalk lifts.

On the second floor are the main offices of the school, a reception room, handsomely paneled in oak, a private office, secretary's office and a library, together with the requisite stationery rooms and janitor's quarters. There are also two class rooms, one of which is very large.

On the third floor there are four large class rooms. Two of these can be thrown together by rolling partitions, forming a large lecture hall about 4,000 square feet in area.

On the fifth floor there are five class rooms similar in character to those below.

The building is of fireproof construction. Special attention has been paid to the ventilation and the lighting and it is equipped with a vacuum cleaning system, drinking fountains, and all modern safeguards for the convenience and safety of its occupants.



LOEW'S GREELEY SQUARE THEATRE, 6TH AVENUE AND 30TH STREET, NEW YORK. FIRST STORY PLAN.

Builders: Fleischmann Bros. Co. S. S. Sugar, Architect.

LOEW'S GREELEY SQUARE THEATRE.

S. S. Sugar, Architect.

Builders: Fleischmann Bros. Co.
Electrical contractors: Edwards Electric Construction Co.
Decorations: J. Coleman & Bro.
Switchboards and Panels: Metropolitan Electric Mfg Co.
Esty Automatic Sprinklers: H. G. Vogel Co.

LOEW'S GREELEY SQUARE THEATRE. LONGITUDINAL SECTION AND DETAIL VIEW OF BALCONIES.

Builders: Fleischmann Bros. Co. S. S. Sugar, Architect.
Decorations: J. Coleman & Bro.
Electrical Contractors: Edwards Electric Construction Co.
Star Expansion Bolts Used.

DEPARTMENT STORE OF THE HIGBEE CO.

CLEVELAND, OHIO

AS an example of a thoroughly modern and well-planned department store for a small city, the building erected for the Higbee Company in Cleveland, Ohio, is in all probability typical. In plan the building has a frontage of about 105 feet and a depth of 184 feet on the side street. Above the first floor the depth of the building is 150 feet. The rectangular plan has been laid out into an even system of bays which possesses the advantage of making perfectly regular floor divisions. The building is of fireproofed steel construction. There are three Otis electric passenger elevators, and one freight elevator. These are all enclosed in fireproof partitions and are operated from the basement to the top floor. The doors and enclosures are of ornamental iron set with panels of wire-glass. The stairway is enclosed in the same manner. The automatic sprinkler system is of the concealed pipe type usual in department store construction. The regular planning of the building has enabled an arrangement of the automatic sprinkler system so that there are four heads placed in each ceiling panel throughout all the open floor areas.

The exterior of the building is as representative of good design in department store work as the interior arrangements. The pilasters of the front indicate the divisions of the interior, and the regular bays and the window openings are as large as is practical. The exterior is entirely of glazed white terra-cotta with ornamental relief decorative courses at the first story level and the cornices.

APARTMENT AT 49 CEDAR STREET, CHICAGO, ILL.

Marshall & Fox, Architects.

THE STORE OF THE HIGBEE COMPANY, EUCLID AVENUE AND EAST 13TH STREET, CLEVELAND, OHIO.

Abram Garfield, Architect.

Otis Elevators.
"Solar Prisms," In Transoms and Sidewalk Lights: The Solar Prism Co.
"Peelle," Counterbalanced Fire Doors.
International Automatic Sprinklers.

BOOK REVIEWS

THE DESIGN OF WALLS, BINS AND GRAIN ELEVATORS. By Milo S. Ketchum, C.E. Second Edition, revised and enlarged. New York: The McGraw-Hill Publishing Company. Price, $4. net.

In this new edition of Mr. Ketchum's work, there have been added about 150 pages of new material, including illustrations. The book covers the advancement in engineering methods which has occurred in the four years since the first edition appeared. Chapters IV. and VII. have been entirely rewritten, and the new material includes two new chapters—IA and IVA. General material added throughout the book includes examples of retaining walls and additional formulae, methods and forms of construction, and a description of three additional reinforced concrete grain elevators. An appendix gives a brief resume of concrete, plain and reinforced.

The chapter headings are: the design of retaining walls; Rankine's theory; Rankine's theory modified; Coulomb's theory; design of masonry retaining walls; reinforced concrete retaining walls; effect of cohesion—stresses in bracing of trenches—stresses in tunnels; experiments on retaining walls; methods of construction and cost of retaining walls; design of coal bins, ore bins, etc.; types of coal bins, ore bins, etc.; stresses in bins; experiments on pressures on bin walls; design of bins; examples and details of bins; cost of bins; methods of handling materials; design of grain bins and elevators; types of grain elevators; stresses in grain bins; experiments on the pressure of grain in deep bins; examples of grain elevators; cost of grain bins and elevators; Appendix 1, concrete plain and reinforced.

LAMPS AND SHADES IN METAL AND ART GLASS. By John D. Adams. Popular Mechanics Company, Publishers, Chicago. Price, 50 cents.

This book is particularly designed for the amateur, and shows the methods of constructing electric lamp from light metal and glass. Drop lights, reading lamps, dining-room domes, mission chandeliers, hexagonal lamps and others are shown.

The first part deals with built-up shades, the second with soldered shades, the third with etched shades, and the fourth with sawn shades. All the fixtures can be easily constructed with simple tools. All the designs shown have detailed drawings accompanied by photographs of the finished fixture.

WOODWORKING FOR AMATEUR CRAFTSMEN. By Ira S. Griffith, A.B. Popular Mechanics Company, Publishers, Chicago. Price, 25 cents.

This is a small book which gives practical instruction on the proper use of woodworking tools, and the simple expedients used by good joiners in their trade. The first chapters of the book deal with the tools, and the latter chapters with the making of various objects, such as stands, a table, cabinet, etc. Throughout, the book is profusely illustrated with little line diagrams which often explain more fully than words the purpose of the writer.

ELECTROPLATING. A treatise for the beginner and for the most experienced electroplater. By Henry C. Reetz. Popular Mechanics Company, Chicago. Price, 25 cents.

This elementary text-book on electroplating is another of the Popular Mechanics' Series. It treats the subject in a way that you can understand, and contains numerous illustrations in connection with the text.

ELECTRIC TRANSMISSION OF WATER POWER. By Alton D. Adams, A.M. New York: The McGraw Publishing Company. Price, $3. net.

This is a general treatise on the subject of the development of electric power by water and the transmission of the same to points of use. In view of the recent reports which have appeared concerning the water resources of the various States of the United States, this book possesses a general significance that should make it of value to many besides the hydraulic and electrical engineer. The text is descriptive and is very fully illustrated with photographic reproductions and plans and sections of power houses, turbine installations, pipe lines and canals for water transmission, electrical generator layouts, and diagrams of the machines. A most instructive portion of the book is that dealing with electrical transmission lines and their economic construction and maintenance. The chapters of the book cover the following subjects: Water-power in electrical supply; utility of water-power in electrical supply; cost of conductors for electric-power transmission; advantages of the continuous and alternating current; development of water-power for electric stations; location of electric water-power stations; alternators for electrical transmission; transformers in transmission systems; switches, fuses and circuit-breakers; regulation of transmitted power; guard wires and lightning arresters; electrical transmission under land and water, etc.

Art and Architecture

IN THE ARTS THERE ARE THE MOST ENDURING MONUMENTS OF MAN

Such is the underlying sentiment of a paper cn the "Relation of the University to the Fine Arts" by Professor Edward Robinson, which appeared in the Columbia University Quarterly for December, 1911. In explanation of the importance of a study of the fine arts, Professor Robinson says that this study should be one of the great branches of university instruction, "—giving students the means of appreciating intelligently the great works of the past, of entering into the spirit in which the men of the great artistic périods of the world's history have expressed their highest aspirations, their most ideal selves, whether in poetry, architecture, sculpture, or painting." In further comment, there is at present no school or course of instruction in the Fine Arts in any university which presents the subject from Professor Robinson's standpoint. In closing he says: "Therefore I look, I hope I may say, with confidence, for the time when there shall be a thoroughly organized department of the fine arts, for the teaching of the various branches of the history of art, both ancient and modern, and for the training of specialists of which this country stands so much in need."

ARCHITECTURAL QUARTERLY OF HARVARD UNIVERSITY

This new architectural publication appears for the first time in March, and its purpose is to present in easily accessible form illustrations of important work done by the students in the architectural course at Harvard. The text will consist of contributions by members of the teaching staff, and graduates, and the paper will also provide a medium for the publication of special lectures which will be delivered at the school. In the first number there is an article on "Architectural Acoustics," by Professor W. C. Sabine, and an essay on "The Medieval Town Halls of Italy," by H. E. Warren. There are numerous illustrations.

At a special meeting of the San Francisco Chapter A. I. A., on February 20, 1912, there was a large attendance. Besides the regular members present, Messrs. Thomas F. Hastings, William Symmes Richardson, Henry Bacon and Robert Farquhar, who form the advisory council of the Panama-Pacific International Exposition, were present as guests. All of these gentlemen made remarks concerning the architectural possibilities afforded by the site of the 1915 exposition.

THE EXHIBITION OF THE PITTSBURGH ARCHITECTURAL CLUB

The seventh annual exhibition of the Pittsburgh Architectural Club has just come to a close. It was as particularly notable for its good arrangement as for its exhibits. There were about 600 drawings and photographs on exhibition, as well as examples of decoration as it enters into architecture, mural painting, stained glass, cabinet work, interior decoration, etc. Mr. Henry Hornbostle exhibited some large pencil drawings of the New York East River bridges. The original drawings for the competition for the general plan of the Northwestern University and some of those now under way for the University of Pittsburgh and the Carnegie Technical Schools were also shown. Dwelling house architecture was represented by many exhibits. The four prize-winning designs for the Perry Memorial monument to be erected at Put-In Bay on Lake Erie attracted considerable attention. Exhibitions of students' work from the principal architectural schools of the country were also to be seen.

At the February regular meeting of the Philadelphia Chapter A. I. A. attention was called to the atelier now being conducted by the University of Pennsylvania, stating that besides the courses in elementary arithmetic and history of architecture now being conducted, a third course should immediately be started in construction. These courses consist of twenty-five lectures each. The work is being conducted under the direction of the Chapter.

On the subject of office practice, Mr. Boyd, in a brief address, outlined a document which should form a basis of understanding between the architect and the owner. Such a document might eventually be adopted by the Institute as one of its standards. It might present a combination schedule of charges, code of ethics, and rules for the control of competitions.

The Indianapolis Architectural Club, which was organized November 13, 1911, with thirteen charter members, has now reached a total membership of forty-five. The officers are C. W. Beelman, President; R. E. Backus, Vice-President; S. C. Duval, Secretary; T. L. Brookie, Treasurer; John Deery, Librarian; B. W. Day, Chairman Current Work Committee

The club holds two meetings a month, and besides this is carrying on classes and lectures to which all club members have admission. The activities of the club are numerous, including prize competitions for various designs and special addresses before the club meetings. Professor Laird of the University of Pennsylvania is to deliver a special lecture. The lectures and classes are held at the John Heron Art Institute.

NATIONAL ACADEMY OF DESIGN EXHIBITION

The 87th annual exhibition of the National Academy of Design opened in the galleries of the American Fine Arts Society at 215 West 57th street, on March 9, and will continue until April 14. According to the rules, only exhibits of original work in oil and sculpture are eligible; further, these must be works of living artists that have never before been publicly exhibited in New York City. This latter clause was not strictly adhered to, however, space being allotted to William St. John Harper's "Winter's Veil" and to "My Bunkie," by Charles Schreyvogel. It was announced that the entire South Gallery would this year be devoted to the exhibition of sculpture, but as a matter of fact the representation of sculpture is exceedingly small in extent (the exhibits are 25 in number) as well as in the individual pieces. The most prominent work is the "Tortoise Fountain" by Janet Scudder, which occupies a position in the center of the middle gallery and is in operation. It is a bronze of very charming and graceful design. As to the special awards, the Julia A. Shaw memorial prize was won by the "Portrait of Mrs. John Henry Hammond and Daughter," by M. Jean McLean; the Saltus medal by "The Hills," by Bruce Crane, N. A.; the Inness gold medal went to Albert Groll, N. A., for his "Lake Louise, British Columbia"; Charles Rosen won the first Hallgarten prize with "A Rocky Ledge" and Everett L. Warner took the second with "Along the River."

There are an unusually large number of unusually pleasing portraits. One of the most delightful is "Little Jane B.," by Hilda Belcher. The American Indian and scenes from his country are apparently receiving each year a little more of the attention that they deserve from American artists. There were several such in this years' exhibition. "In the Sun," by Frederick C. Frieseke is a puzzle. A nude female figure, a glimpse of a pool, sunshine and foliage in abundance, a very modish striped parasol, and a heap of something that might be the discarded clothing of the young lady. The conception of the picture seems false; it is too modern to be allegory, and too allegorical to be modern. It seems captious, however, to waste space when space is limited, to find fault, leaving so much that is good unnoticed. There seems an unusually large number of pictures that recommend themselves, in size and in conception, to the ordinarily cultured person for the decoration of his walls, which may or may not seem flattery to the artists.

Fireproofing and Fire-Protection

MR. G. W. STEWART

FIRE IN CITY INVESTING BUILDING

A fire which occurred in the City Investing Building on February 15 is of particular interest as pointing to small defects which may not be considered as serious at the time of the original construction and yet may develop into a serious menace on the occasion of a fire. Superintendent F. J. T. Stewart of the New York Board of Fire Underwriters says:

"The damage was mostly confined to the electrical equipment inside the shaft, consisting of cables and insulation on same; also the electrical elevator control apparatus at 32d floor. There was considerable damage to woodwork used in roof construction; the sloping roof of the 32-story portion is covered with sheet copper on wooden purlins about 2x4 inches, set 28 inches on center between 2-inch tile on T irons; this portion of roof also had two small thin glass sidelights in wood sash, which burned out and afforded a vent for the fire. A few wooden coat and hat racks in porters' closets, over doors to shaft, were also slightly damaged.

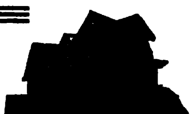
"While the fact that this fire did not result more seriously is quite a tribute to the building, from the viewpoint of fireproof construction, it has, nevertheless, developed two interesting points of weakness. First, is the introduction of unnecessary inflammable material inside the wire shaft. Second, the use of wood nailing strips in connection with the roof construction over the 32-story portion. This seemingly unimportant detail, together with the ordinary wood sash windows in the same roof, is responsible for considerable damage which would otherwise have been avoided."

THE VANDERBILT HOTEL FIRE

We quote another report by Superintendent Stewart, which shows very creditably for the thorough construction of this new hotel.

"The fire, although intensely hot, was confined to the floor where it originated and largely to the north half of the floor. The absence of all woodwork in the interior construction and trim afforded the fire but little opportunity to spread. The steel corridor doors to rooms and floor openings withstood the fire well and held it in check wherever they were closed. The doors into several of the rooms were, however, open at the time, thus permitting the flames to enter nearly one-half of the rooms on the floor. The loss was confined chiefly to the new furniture and carpets stored in bulk at the point where the fire

(*Continued on page 24*)


started, most of which was destroyed or seriously damaged. The damage to the building was comparatively slight and confined strictly to the fourth floor except some water damage to the first floor ceilings, the intermediate floors apparently having suffered no injury. The plastering on the fourth floor was scaled off where the fire was hottest, but the tile furring and under side of cinder concrete arches were not damaged.

"The confinement of this intensely hot fire to a relatively small space on the floor where it originated was doubtless due to a great extent to the fact that all openings into stair and elevator shafts and also those in corridor and room partitions were provided with fire doors, and to the absence of all wood or other combustible material in the interior trim and finish of the building, thus illustrating the marked advantages of this character of construction. A fire of this nature in a building less thoroughly fireproofed would most likely have resulted in a far more serious loss, if not the practical destruction of the building."

THE OFT-REPEATED STORY OF THE SHINGLE ROOF

According to the papers of February 21 and thereafter, a fire occurred in Houston, Texas, on that date, which razed 25 blocks and destroyed $5,000,000 of property. The fire started in a small one-story frame building and sparks and brands were blown by a high wind to nearby shingle roofs on frame structures. The result was inevitable, and the fire spread to mills, factories and manufacturing plants, destroying everything in its path and was only checked at Buffalo Bayou, a small stream that intercepted its course.

FIREPROOF DIGEST

This is the title of a new publication which has appeared with its first issue in February. The appearance of the publication is promising, and it has a new field before it—that of a popular magazine of fireproofing and fire prevention; one that will appeal to the general reader who has a serious turn of mind. The preparation of the paper is most excellent. It is superbly printed, and the illustrations appear to the best advantage. The articles relate to the general subject of fireproofing and fire-prevention and are of a more or less popular nature.

(*Continued on page* 26)

TO IMPROVE FIRE HOSE

Sec. Wentworth Urges It Be Brought Under Governmental Regulation

BOSTON, MASS., Jan. 16, 1912.—Speaking here tonight at the fifteenth annual banquet of the Boston Credit Men's Association, at Young's Hotel, Franklin H. Wentworth, secretary of the National Fire Protection Association, declared that if the manufacturers of fire hose are not willing voluntarily to improve the quality of their product their business should be brought under Governmental regulation. "An act of Congress was necessary," he said, "to protect the people from the poisons of adulterated drugs; and a like enactment may be necessary to protect them from shoddy fire hose. It would seem that those industries which thrive upon the common dangers and misfortunes should be especially sensitive to their public responsibilities in the furnishing of an honest product. Unfortunately, as our fire dangers and fire waste have increased, the quality of public department fire hose has deteriorated. Every piece of hose which bursts at a fire may cause loss of life and must necessarily cause loss of property by delaying the extinguishment of the fire. From Maine to California there come to my desk almost daily reports of bursting hose. There is no excuse for this except that it makes a market for hose. The manufacturers can make a hose that will not burst. At a fire in Norwich, Conn., the other evening, Chief Stanton was compelled to cut a piece of hose that had been in constant use by his department for twenty-three years. The hose manufacturers are not selling that quality of hose to fire departments today, and do not wish to.

"There has always been more or less of a mystery regarding the make-up of fire hose and this has been fostered by those engaged in its manufacture. Very few buyers or users have had sufficient technical knowledge of the ingredients used or of their assemblement to enable them to prepare specifications sufficiently well balanced to insure the receipt of fire hose of the quality desired. Municipal authorities and fire departments have been obliged to accept the statements of the manufacturers or their sales agents and to purchase fire hose without any real information as to the quality of the goods paid for.

"This has led to the establishment of the present almost universal practice of selling fire hose under 'trade names' or 'brands' which are supposed to indicate and in many cases undoubtedly have indicated the quality of the materials supplied. In consequence, where the better qualities of fire hose have in the past been secured, a very strong inclination is found on the part of the fire departments to continue to buy the particular brand which, in their opinion, has given good service. This is natural and so long as the trade name represented the high quality of materials which was responsible for its good reputation, no great danger existed."

DEPARTMENT CONSOLIDATION

At the monthly meeting of the Wychoff Heights Taxpayers' Association, Adam E. Fischer, a New York architect, offered a resolution which embodied the following recommendation "We recommend that the work now being done by the Bureau of Fire Prevention, Health, Water, Tenement House and Building Departments, where applicable to the construction and alteration, as well as to the inspection of buildings, be consolidated under one head, thereby fixing the responsibility, reducing the cost of maintenance to a reasonable amount,"—— Resolutions of this character which involve the re-organization of city departments often appear, but the actual work of such re-organization is not only difficult, but expensive, and with the usual entry of political influence, it is doubtful if such a movement would be a real advantage when put into effect.

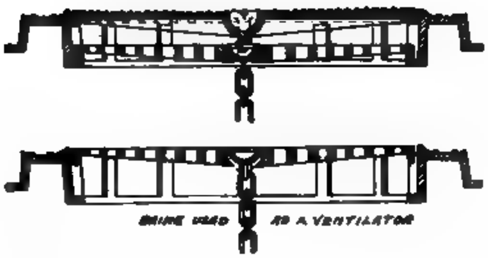
A paper entitled "The Arrangement and Layout of the Machine Shop" was delivered by Mr W. T. Walters before the American Society of Engineer Draftsmen on March 21. The assumption was made in the beginning that a proper building was in existence which answered all requirements. The paper was synthetically developed, and delivered in a concise, tabulated form, presenting the possibilities that might be met in designing a machine shop for different classes of manufacture. It was a useful presentation of the idea, and one that might be used to advantage by an architect who was called upon to design a mill or factory building to contain a machine shop, in that given the requirements, he would have a better grasp of the uses to which the building was to be put and could therefore better its design.

Two papers read before the American Society of Enginer Draftsmen on February 15th attracted a considerable audience. One related to the "Training of Draftsmen" by Prof. F. G. Higbee, and the other to "A Number of Common Faults of Draftsmen," by William F. Turnbull.

Industrial Progress

COAL HOLE COVER AND VENTILATOR

A new device has been placed on the market by the Brooklyn Vault Light Company, which is a vast improvement over the ordinary type of coal-hole cover or manhole cover which is employed in city buildings everywhere over side-walk vaults and coal chutes into the basements.



This device, as shown by our illustrations, combines with the ordinary coal-hole cover a ventilator. The ventilator rests just below the cover, and when it is desired to obtain a circulation of air through the opening, the top cover may be removed and the lower or ventilating cover lifted into place and brought to the level of the side-walk. The sectional illustrations explain the working fully. The cone lock engages a hook in the bottom of the top cover and is fastened by means of an ordinary chain to a hook or fastening in the cellar or vault below. When the chain is released, the upper cover may be raised, the cone unhooked, the ventilator cover raised into position, and again fastened securely by the chain, by means of this cone, as shown in the lower illustration. The great advantages of this device, which is known as the duplex safety coal-hole cover and ventilator, are the simplicity of its operation and the cone lock which provides a fastening for both top cover and grating when either are in use. Further circular matter descriptive of this invention may be obtained from the Brooklyn Vault Light Company, 262 Monitor St., Brooklyn, N. Y.

The Osborn Engineering Company announces that on and after April 1, 1912, their main offices will be located at 740 Engineers' Building, Cleveland, Ohio.

SPRING IS HERE

and with the flowers that bloom in the spring come the candidates, ornithological, political, etc. Promises are as abundant as buds on the peach tree. The point we make is, what will be the performance, the fruit, for, like Harriman, "we are practical men."

The sparrow begins at dawn with a brave chirp, but up to dewy eve he has not evolved anything fuller than a repetition of that noise, thin as tin.

The lustrous starling sits on our fence, opens his great yellow bill and promises something wonderful, but to date it has amounted to nothing more than a raucous disappointment. Robin red-breast on our lawn, and spotted thrush in our wood, trill out music that satisfies from promise to performance. Next spring we will choose these two ornithological candidates without giving the others even a trial, for they have made a record.

(Continued on page 32)

The political candidates are springing up everywhere. Their promises fill the air. The people will choose the man who will be strong on performance. Will it be the pedagogue from Jersey, Teddy, the perpetual candidate, the lion of the Buckeye State, the Epictetus of New York. the trumpet of Wisconsin, Clark, Underwood, favorite sons, a dark horse, or Billiken, who says he is the "God of things as they ought to be"?

The paint candidates also bloom in the spring. Examine their composition and record. The National Hardware Bulletin of October 1911 urges users to shun protective paints that use petroleum or its products as a vehicle or adulterant. Dixon's Silica-Graphite paint uses only pure, boiled linseed oil as its lasting and elastic vehicle. There is a persistent cling and resistance to abrasion about it because of the paint's silica ingredient. The graphite in it makes it a peerless paint for unctuousness and resistance to gases, brine, acids, ice, damp, heat and cold. It costs a little more, but it is economical because of longer service, thus saving in labor and material. The record tells. We have made Dixon's Silica-Graphite paint in one quality only for nearly fifty years—four colors. Use it in original cans, and see that the contractor does not adulterate and that he steel-brushes the surface. Used around the circle of the world on leading railroads, bridges, buildings, pipes of all sorts, fences, gas tanks, water towers, trolley poles and trucks, roofs, steel cars, and wherever there is steel or iron to protect from corrosion.

Spring is here. You will be examining your steel work after the winter's wear. Use peerless Dixon's Silica-Graphite paint to protect it. Made in Jersey City, N. J., for all the world.

From "Graphite" for April.

The Lea Equipment Company have just issued a pamphlet descriptive of several types of high-duty, turbine pumps, or centrifugal pumps, such as they manufacture. These pumps are thoroughly adaptable for fire service and a list of four standard sizes together with the number of $1\frac{1}{8}''$ streams each will supply at 100 pounds pressure is given. A curve of the efficiency is presented, as well as a diagram of the structural features of the pump. This firm has moved its general offices to Philadelphia in connection with its works.

(*Continued on page* 34.)

The subject of lubrication for mechanical installations, even the smallest of isolated plants, is one which requires study so that the maximum economy may be obtained while the plant is in operation. In designing a mechanical plant for a building of any size, an architect is dependent upon the mechanical engineer for his assistance and advice. Yet the architect requires a general knowledge of the subject. Complete lubricating systems which pipe the oil from a central reservoir direct to all the machinery, re-collect and clean the waste, are frequently being installed. The economy of these systems is unquestioned and in planning a mechanical plant and estimating its original cost, such a system should be included by the architect.

We are in receipt of an interesting booklet distributed by the Metropolitan Electric Mfg. Co., which is descriptive of the detachable mechanism, push-button switches, lock switches and flush receptacles manufactured by them. The booklet contains a number of well executed and interesting cuts, showing push buttons, plates, contact boxes, plugs, etc. A price list together with a table of standard sizes for gang plates and tandem gangs is another interesting feature of the book and will prove of great assistance to the prospective purchaser in selecting materials and gauging expense.

The Metropolitan Electric Mfg. Co. would be pleased to send a copy of this booklet to any one interested, upon application to them at their office, East Avenue and 14th Street, Long Island City.

The National Tube Company, of Pittsburgh, Pa., have issued a bulletin known as No. 7, concerning their re-grinding valves. To any architect or engineer requiring such products and wishing to investigate the merits of various patterns, this bulletin is of value. Bulletin No. 5, issued by the same company, deals with steel pipe versus wrought iron pipe in refrigerating work, and is an instructive paper.

An automatic cellar drainer particularly adapted for use in pits, sumps, cellars, tanks, or other receptacles where it is desired to keep water or other liquids at a given level, has been placed upon the market by the Penberthy Injector Company, of Detroit, Mich. The drainer is operated automatically by a float which controls a quick opening and closing valve. It is so arranged that the valve is never partly open. The float is so controlled that when the high point of the water is reached the valve is thrown fully open and when the low point is reached the valve is completely closed. This gives quick, positive action to the drainer, which operates on the injector principle and reduces the time of service and prevents dripping, leakage and other annoyances.

Heraldry Illustrated

By WM. H. ABBOTT

Being a short account of the

Origin and History of Heraldry

and an explanation of its nature, with practical directions for drawing and

Painting Coats of Arms

to which is added a Glossary of the terms used in the Science of Heraldry. There is also a chapter on the drawing and painting of Coats of Arms, which will prove of great assistance to those unaccustomed to the work. The glossary contains about fifteen hundred definitions of heraldic terms, many in French and Latin.

To Architects, Designers and others who desire to acquire a knowledge of this interesting art, it will prove of invaluable service.

700 Explanatory Engravings, 127 pages, bound in red cloth; price, $2.00.

THE WM. T. COMSTOCK CO.

PUBLISHER

23 Warren Street NEW YORK

FIRE PREVENTION

Architecture and Building is about to present a series of articles dealing with the practical preventive measures of this now country wide movement to check our great national extragavance: ***The Annual Fire Waste.***

Automatic Sprinkler Equipment of Loft Buildings is the first subject to be treated. These articles will be written by Mr. E. P. Boone, Superintendent of the Automatic Sprinkler Department, New York Fire Insurance Exchange.

The architect stands between his client and the outer darkness on all points of building construction. With ever increasing frequency, these days, is he called upon to explain a sprinkler system, outline the method of its installation, and give its approximate cost.

These articles by Mr. Boone will be a practical study of sprinkler, standpipe and supply tank equipments, considered as a portion of the original building design. It is the author's intention to give that amount of technical information which is necessary to a good understanding of the practical principles of an automatic sprinkler equipment without an engineering treatment of the hydraulic problems involved. The illustrative drawings which have been prepared are taken from actual, approved installations. They show sprinkler equipments in several types of building, and illustrate how a building of any particular class may be properly equipped.

The complete series will give the full information that it is necessary for an architect to have in planning a building in which he expects to install a fire protective equipment.

THE AMERICAN FIRE WASTE AVERAGES $250,000,000 PER YEAR

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THE WILLIAM T. COMSTOCK COMPANY

Architecture and Building

Established 1882 | A continuation of the Architect's and Builder's Magazine, 1899-1911 | Continued 1911

PUBLISHED MONTHLY BY

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WM. PHILLIPS COMSTOCK, President

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Special Hotel Issue

These Regular Serial Articles Will Be Continued in the May Issue

ADVERTISING REPRESENTATIVES
D. R. Gimbel
Geo. H. Stewart (Dept. of Fireproofing and Fire Protection)

EDITORIAL DEPARTMENT
Wm. P. Comstock, Managing Editor
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Classified Advertisements

NOTE.—Every classified advertiser is entitled to insertion under one heading. Under extra headings, $5.00 a year each

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A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. APRIL, 1912 *NUMBER 4*

A HIGH BUILDING THAT IS BEAUTIFUL

By J. L.

IN turning over the leaves of a recent number of an architectural magazine in which was a profusely illustrated account of the work of a famous firm of Western skyscraper architects, I could not help admitting the severe plainness, to put it mildly, of the majority of the buildings shown. Passing from the text to the advertising pages and looking for the inevitable contributions of the various contractors and supply men, the builder who built this list of buildings or that list of buildings designed by the aforesaid architects or the manufacturer who equipped this building or that building, I was amused at the announcement of a firm which supplied metallic furniture equipment, also designed by the aforesaid. There was a half-tone picture of an interior, and standing on the floor was a filing case, twenty-two stories high, for all the world like any one of a half dozen of the great buildings which the architects had designed. And that very day, I had listened to a disgruntled party roasting the tall buildings and likening them to filing cases.

Now, I for one am an admirer of the skyscraper, and I have always felt like rising to protest against the abuse which is heaped upon our great American institution, the many-storied building, by professional architectural critics, who presumably voice the sentiments of the best practitioners in the profession.

The skyscraper is not new. The cathedral at Cologne is just a skyscraper; the Parthenon, even, was one of the skyscrapers of its day; St. Peter's at Rome is another, and St. Paul's in London is another. I never heard of Sir Christopher Wren's great monument being criticized for the "utter recklessness" with which millions were invested "by people who trust to luck for their light," quoting some of the words of a leading architect who recently syndicated an interview on the subject of high buildings; yet the problem of light in St. Paul's Church in London was so poorly solved that Sir Christopher's famous epitaph was legible only on very rare occasions. When I was in the church some years ago, my principal impression was of a building as dark as a pocket. I understand the church is now lighted artificially by means of an electric plant donated by a citizen of the land of the skyscraper.

There is one great architect in this country who said in an address some years ago that the designing of the many-storied building was the most sublime problem that Infinite Wisdom had given man to solve. I refer to Mr. Louis H. Sullivan, a man who has, through his own work and through the work of others who have copied him, dotted the surface of this broad land with a thousand monuments to Sir Christopher Wren's one. If you seek Sullivan's monument, look around almost any city west of the Allegheny Mountains, with a scattering few east.

Despite the scoffers, the skyscraper

has come to America to stay. It is, indeed, what the logician would call the definitive American institution. Not only are our great cities distinguished by groups of twelve story, sixteen story, eighteen, twenty story buildings at their business centers, but the small towns have their tall buildings. In this land of money grubbing these temples to the "Almighty Dollar" are beginning to overshadow the old houses of worship. And the village skyscraper, marking some "civic center," now overtops the spires of the meeting houses in many and many a rural town.

Leaving it for other critics to discuss all questions of planning, architectural style and detail and the economics of the skyscraper, forgetting that cruel taunt about filing cabinets, it is interesting to inquire whether beauty can be an attribute of one of these lofty structures. The Greek and Roman and Middle Age and Renaissance skyscrapers are safe from our criticism, for they were dedicated to other gods than those of this twentieth century.

There are doubtless many "good" skyscrapers, well planned, comfortable, light and profitable to their owners. But of good looking, not to say beautiful, skyscrapers, alas, I fear there are not many, the more's the pity. But that, I solemnly affirm, is not the fault of the skyscraper itself. No; the fact that the filing cabinet designed by Messrs. So & So, architects, bears a strong resemblance to some of New York's best, and is, beside, one of the best "lookers" designed by the firm, is no fault of the buildings but of the men that built them. But let us get the "good" ones and then try for the beautiful ones. In the first place, a "good" one is a mass of windows; its front is peppered full of them—no place for ornament or decoration. In the second place, our artistically trained architects are trying to clothe our American building's form with the architectural dress of some foreign country, France, for instance, where there is not a commercial building in the whole land over seven stories high.

What can be more distressing to the trained "aesthete" than to be asked to treat a façade twenty stories high, where it is required that thirty or forty or even fifty per cent. of the area shall be glass? No wonder they try to cut down on the windows so as to increase the wall surfaces. Oh! for a commission to build a building without windows, like the Campanile at Venice, a skyscraper *"as was"* a skyscraper, and is again by this time, I suppose. No windows to bother that architect. Of course, there were a few peep-holes to light the stairs, but I never heard what the Campanile was good for except as a part of the show, like the tall man at the circus.

The problem of skyscraper designing resolves itself into one of form and surface. Form is noted in the sky line, whether of the top or of the sides. Surface is of necessity concerned with that architectural nuisance, the mass of windows. The problem of the sky line is solved only by regard for the optical illusion, which is just as present and insistent as it was when the Greeks studied the problem and solved it by means of the entasis.

One thing that few architects have even thought of is the entasis, although on it depends that most important thing, the repose of the design. Basing their theories on the French style, it has been a common practice to design a front with a projecting base, a vertical shaft and a projecting top member or architrave. This may be all right with a low building, but it is all wrong with a tall one. To produce upon the mind of the spectator the soothing effect—the satisfaction—that is a quality of architectural beauty, it is desirable that there should

THE VANDERBILT HOTEL, 34TH STREET AND PARK AVENUE, NEW YORK.

Warren & Wetmore, Architects.

Builders: Wm. L. Crow Co.

C. O. Mailloux } Consulting Electrical
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be an entasis. Whether a building stands remote from other buildings in such a position that it can be viewed from a distance, or whether it rises in a narrow street where the spectator stands so close that the line of vision is elevated, entasis is a desirable feature, becoming as the point of view is nearer and nearer a most important part of the design. This entasis is not Greek, or Roman, or Gothic or Renaissance; it is human.

Architecture is like sculpture, and silhouette is with both a vital matter.

Some of our New York skyscrapers have a beautiful entasis. The Hotel St. Regis, at Fifth Avenue and 55th Street, is in my opinion, with respect to its silhouette, well nigh perfect.

The first thing that the mind grasps in gazing at a tall building is that optical illusion of overhanging, of something impending, that is present in the wall which is absolutely perpendicular. Some architects have built their walls with a slight batter to overcome this illusion, but the eye does not take kindly to a wall that is out of plumb, unless it can see another wall leaning to meet it, as in the Bunker Hill Monument, for instance. The west wall of the New York Library at Fifth Avenue and 42nd Street has this disfigurement. An example of the lack of repose produced by an overhang is the Hotel Belmont. The architects seem to have been not satisfied with the result in this building, for they have tried a different expedient on the Vanderbilt Hotel, and in my humble opinion it is a success. They have secured repose, that first requisite of a good design, not by battering the walls, but by setting back. The old habit still clung, however, for there is an overhang of the base of the top member of their design.

So much for the vertical component of the silhouette of this building. The series of festoons that form the sky line seemed at first to be a mistake, but later, viewed from near at hand, they strike one as being not the least of the charms of this design.

The problem of the surface has been even more successfully solved in this building. By eliminating as far as possible the reveal of the windows, they have given a mass to the front that one would not have believed possible. In several other respects Messrs. Warren & Wetmore have done things which entitle them to praise, if not indeed to glory. Their use of one principal material, brick, from the water table to the roof, is another common sense feature of this remarkable design.

And to crown the whole work, the color, the polychromatic gray brick, a "close harmony" of hidden and indescribable golden browns and blues, and all trimmed with stone colored terracotta, forming with the sky as a background a blue and gray symphony—it is a sight worth crossing a continent to see!

THE SILVER SERVICE OF THE VANDERBILT HOTEL.
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THE VANDERBILT HOTEL. DETAILS AT THE TOP STORIES.

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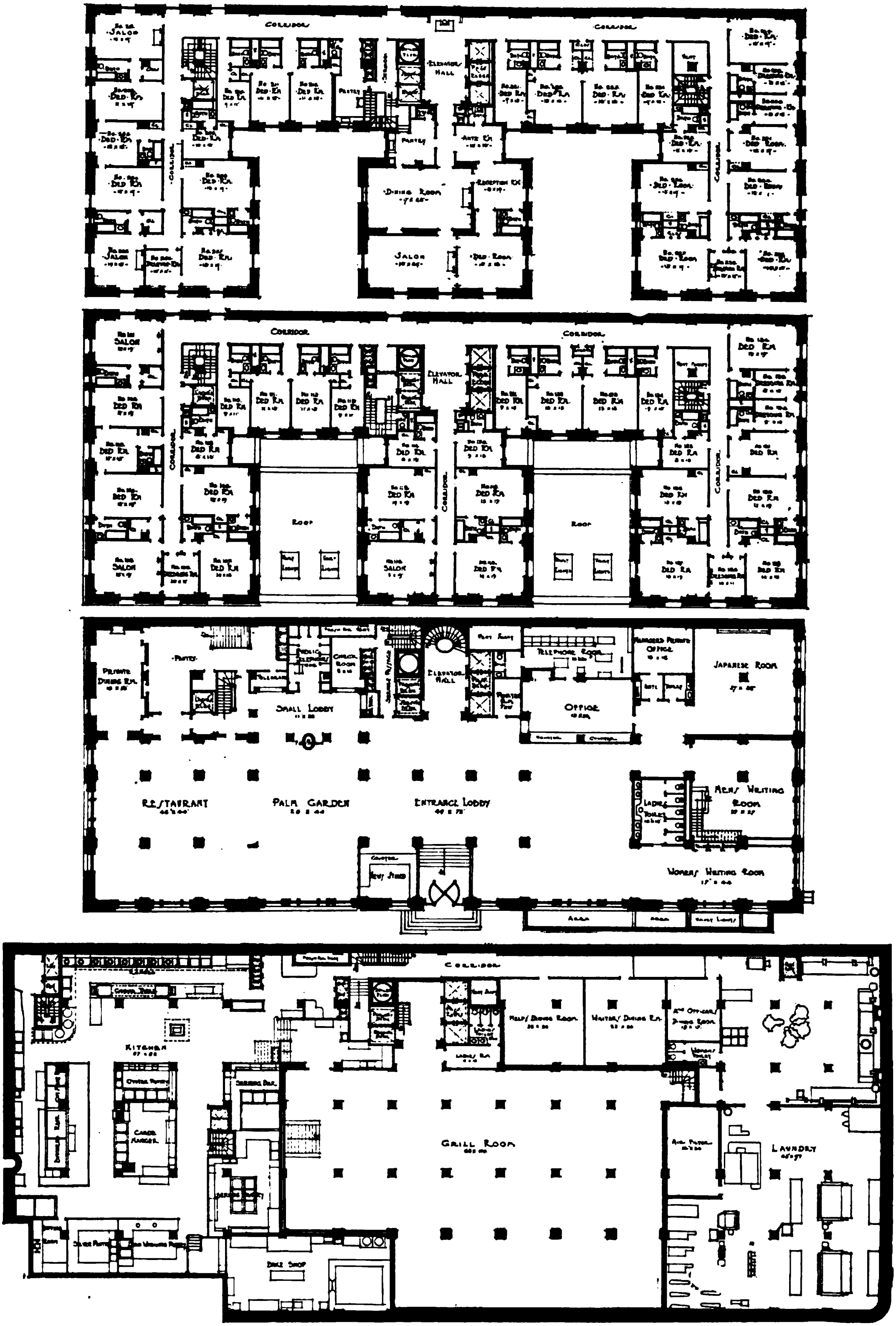

THE VANDERBILT HOTEL. PLANS OF THE BASEMENT, GROUND, FIRST AND SECOND STORIES.
The First Story Is Practically Typical of All Upper Stories.
Warren & Wetmore, Architects.

THE VANDERBILT HOTEL. ENTRANCE LOBBY AND LOUNGE.

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Warren & Wetmore, Architects.

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Warren & Wetmore Architects.

C. O. Mailloux } Consulting Electrical
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THE VANDERBILT HOTEL. VIEWS IN THE PRIVATE SUITES.

Warren & Wetmore, Architects.

Ornamental Plaster: Davis Brown.
Painting and Decorating: Robert E. Mackay Co.
Venetian Blinds: James G. Wilson Mfg. Co
Flushovalves Used.
Hardwood Floors: Hasbrouck Flooring Co., Inc
Rugs: Bollentin & Thompson.

THE VANDERBILT HOTEL. THE OFFICE COUNTER AND THE JAPANESE ROOM WHICH IS A BUFFET BAR.
Bronze Grille Work: Tiffany Studios. Warren & Wetmore, Architects.

BULLETIN BOARD IN THE MAIN LOBBY
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THE VANDERBILT HOTEL.

The Vanderbilt Hotel is twenty-two stories in height and has three full basements, with a partial fourth. The lower basements are used for the power plant and different machinery. The basement, or one story below the sidewalk level, is for the most part occupied by the Della Robbia grill room. To the south end is the kitchen, and at the north end is the laundry. An entrance from the sidewalk near the south end leads into the café, which is in a mezzanine, and to the gallery around the grill room in the level below. The building is of the usual steel construction, with the Roebling system of concrete arch for the floors. The partitions are of gypsum blocks, and the trim, doors and window frames and sash are of hollow metal. In the service hallways the floors are of cement and the walls wainscoted with thin iron plates.

The fire which occurred shortly after the hotel was opened gave a very good practical proof of the fireproof construc-

THE VANDERBILT HOTEL. AN ELEVATOR FOYER ON AN UPPER STORY.
Warren & Wetmore, Architects.
Elevators: Standard Plunger Elevator Co.
Ornamental Plaster and Caen Stone: Davis Brown.
Electrical Contractors: J. Livingston & Co.
Cork Floors: Hasbrouck Flooring Co., Inc.
Rugs: Bollentin & Thompson.

tion of the building. It burned, as within a stove, a large amount of furniture which was in storage on one of the floors, and although the fire was intense, no damage to the building except of the most superficial character resulted, and the blaze was confined to the point of its inception.

The mechanical equipment of the building consists of a battery of Babcock & Wilcox boilers, which are fed by Wilkinson automatic stokers supplied by a travelling hopper of about 1,500 pounds capacity which is filled by a continuous bucket coal conveyer manufactured by the C. O. Bartlett & Snow Co. There are three direct-connected electric generating sets developing a total of 500 kilowatts. All machinery is oiled by a Peterson central oiling system. There are two garbage cremating furnaces of the Morse Boulger type. The ice machine, which is of 80 tons capacity, is of the Frick

THE TRAVELLING HOPPER FEEDING THE STOKERS.
Made by The C. O. Bartlett & Snow Co.

THE KITCHEN IN THE VANDERBILT HOTEL.
Equipped by L. Barth & Son.
Ice Cream Freezer: Emery Thompson Machine & Supply Co.
Electrical Contractors: J. Livingston & Co.

ammonia compression type. This supplies refrigeration for the hotel in general and for the air purifying and cooling system, which is the Thomas' "Acme," built by Thomas & Smith, Inc. This apparatus is designed to wash and cool the air supplied to the grill room of the hotel. The air is passed through a spraying chamber, wherein it is thoroughly cleansed of dust particles and impurities, and receives its initial cooling. It then passes through a special refrigerating chamber consisting of a gridiron of brine pipes containing brine at 15 degrees F. This reduces the air from 75 to 60 degrees F. The air then passes through an eliminator consisting of vertical non-perforated baffle plates, wherein excess water is separated from the air and from which the free air, thoroughly purified and dry, is delivered to the fan. The apparatus is designed to handle 14,000 cubic feet of air per minute, cooling incoming air from a temperature of 95 degrees to 60 degrees F.

The decoration of the Vanderbilt Hotel is in the Adam style, although quite a different development from that displayed in the Ritz-Carlton, designed by the same architects and completed about a year ago. Without exhaustive description, the illustrations quite fully explain the decorations. In the lounge or office foyer, the relief frieze was sculptured by Beatrice Astor Chanler. Other ornament and furnishing is evident in the illustrations. The rugs, however, which were specially woven for the hotel, are particularly interesting. They were made for Gimbel Brothers, New York, who supplied the interior furnishings from special designs worked out by the architects, by Bollentin & Thompson, their factors. The designs are of Chinese origin, and there are two rugs in the entrance 27 by 48 feet in dimension, colored in royal Chinese blue, with beautiful medallion and duo-tone centers. The various rooms are suitably furnished with appropriate rugs, according to the decoration.

Warren & Wetmore were the architects of the Vanderbilt Hotel. The consulting electrical engineers were Mailloux & Knox. The builders were the Wm. L. Crow Co. Carter, Black & Ayers supplied the front brick.

The electrical contractors were J. Livingston & Co. The wire was supplied by the Habirshaw Wire Company, and detachable mechanism push button switches were furnished by the Metropolitan Electric Mfg. Co. The elevators are of the plunger type and were installed by The Standard Plunger Elevator Company.

The ornamental plaster and caen stone work was done by Davis Brown. Robert E. Mackay Co. did the painting and decorating. The Tiffany Studios did the bronze grill for the cashier's room and other work, and the lighting fixtures were made by the Edward Caldwell Co. The U. S. Changeable Sign Company installed a special hotel bulletin board.

The Hasbrouck Flooring Co., Inc., installed cork flooring in many rooms throughout the building. Venetian blinds were put into all the rooms by the James G. Wilson Manufacturing Co.

The silver service for the tables was designed and supplied by The Gorham Co., L. Barth & Son equipped the kitchen, and the Emery Thompson Machine and Supply Co., put in the ice cream freezers.

The sanitary equipment was put in by The Nason Manufacturing Co. Flushovalves manufactured by the Flushovalve Company were used on all toilets throughout the hotel.

THE HOTEL TAFT

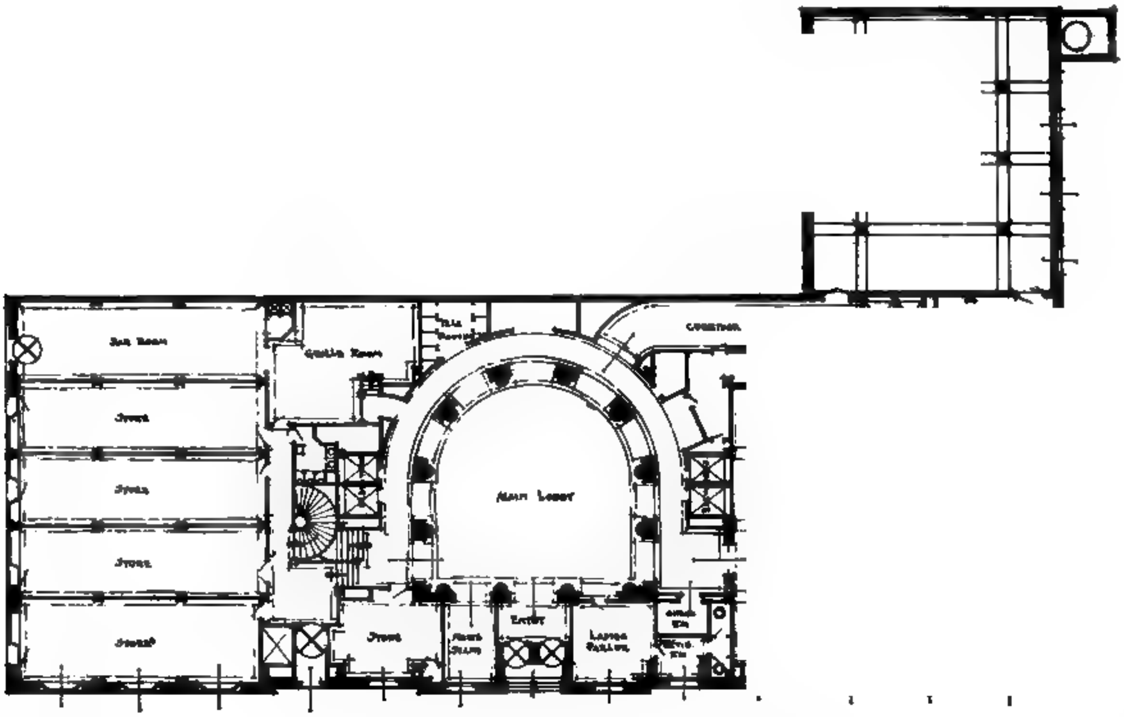
The Hotel Taft contains about three hundred guest bedrooms, each connected with a bath, arranged singly or in suites of three to five rooms. The building has extensive public accommodations, including regular dining rooms, private dining rooms, a banquet hall, roof garden and accommodation for small society dinners. In construction the building is fireproofed with usual precaution. The trim and doors about the stairs and elevators is of hollow metal, thus thoroughly fireproofing these portions of the structure.

F. M. Andrews & Company were the architects of the Hotel Taft. V. J. Hedden & Sons Co., were the builders. The Wells Architectural Iron Company did the ornamental iron work, and the Federal Terra Cotta Company supplied exterior terra-cotta. Lime was supplied by the Farnum Cheshire Lime Company. The front, inside and hollow brick were all furnished by the I. L. Stiles & Son Brick Co. The interior woodwork was done by the John Rouzer Company. The hollow metal doors and trim were installed by the Dahlstrom Metallic Door Co. Wilson's Venetian blinds were used in all the bedrooms. The lighting fixtures were supplied by Baguès Frères Co. Bollentin & Thompson furnished rugs, interior furnishings were supplied by John Wanamaker, N. Y., bentwood chairs by Jacob & Josef Kohn, and the U. S. Changeable Sign Co. put in a special hotel bulletin board. The electrical contractors were the Watson, Flagg Engineering Co. Wire was supplied by the Habirshaw Wire Company, and the Metropolitan detachable mechanism push button switches were used and Otis elevators were installed.

The silver service for the dining rooms was supplied by the International Silver Company. Bramhall-Deane Company equipped the kitchen. The Emery Thompson Machine and Supply Company furnished ice cream freezers. The vacuum cleaning equipment was installed by the Spencer Turbine Cleaner Company.

THE SILVER SERVICE OF THE HOTEL TAFT.
Made by The International Silver Co.

MARQUISE AT MAIN ENTRANCE.
Ornamental Iron: The Wells Architectural Iron Co. F. M. Andrews & Co., Architects.



THE TAFT HOTEL. GROUND STORY PLAN.
F. M. Andrews & Co., Architects.

THE HOTEL TAFT, NEW HAVEN, CONN.

Builders: V. J. Hedden & Sons Co. F. M. Andrews & Co., Architects.
Front Brick: The I. L. Stiles & Son Brick Co.
Electrical Contractors: Watson, Flagg Engineering Co.
Metropolitan Detachable Mechanism Push Button Switches.
Insulated Wire: Habirshaw Wire Co.
Architectural Terra-Cotta: Federal Terra Cotta Co.
Farnam Cheshire Lime Used.
Venetian Blinds: James G. Wilson Mfg. Co.
Otis Elevators.
Hollow Metal Doors and Trim: Dahlstrom Metallic Door Co.

THE HOTEL TAFT. THE ROTUNDA OR GRAND LOBBY.

Ornamental Iron: The Wells Architectural Iron Co. F. M. Andrews & Co., **Architects.**
Electrical Contractors: Watson, Flagg Engineering Co.
Rugs: Bollentin & Thompson
Lighting Fixtures: Baguès Frères Co.
Interior Trim: The John Rouzer Co.
Bulletin Board. U. S. Changeable Sign Co.
Hollow Metal Doors and Trim: Dahlstrom Metallic Door Co.

THE HOTEL TAFT. THE DINING ROOM OR GRAND CAFE.

Lighting Fixtures: Baguès Frères Co. F. M. Andrews & Co., Architects.
Rugs: Bollentin & Thompson.
Interior Trim: The John Rouzer Co.

THE HOTEL TAFT. THE BALLROOM AND DETAIL OF A STAIRWAY.

Bentwood Chairs: Jacob & Josef Kohn.
Lighting Fixtures: Baguès Frères Co.
Ornamental Iron: The Wells Architectural Iron Co.

F. M. Andrews & Co., Architects.

THE HOTEL TAFT. THE BAR AND THE WRITING ROOM.

F. M. Andrews & Co., Architects.

Lighting Fixtures: Baguès Frères Co.
Rugs: Bollentin & Thompson.
Electrical Contractors: Watson, Flagg Engineering Co.
Interior Trim: The John Rouzer Co.
Hollow Metal Doors and Trim: Dahlstrom Metallic Door Co.

THE HOTEL TAFT. THE PALM ROOM AND THE RATHSKELLAR.
Lighting Fixtures: Baguès Frères Co. F. M. Andrews & Co., Architects.

A HALLWAY TYPICAL OF THE UPPER FLOORS.

The steel smokestack of the Hotel Taft, of which we have shown a special illustration, was built by the Felber Engineering Works, and is of great interest. The illustration and the plan of the stack as depicted on the first story plan of the building shows how space has been economized and how little the stack interferes with the plan of the building. This steel stack fits exactly over the proper area which is necessary for the passage of gases from the power plant. It is lined with 2 inches of vitrified asbestos securely attached by clips to the steel shell and entirely covered within with a coating of asbestos cement. While this stack is a permanent

Exterior Smoke Stack of The Hotel Taft.

Built by The Felber Engineering Works.

Vitrolite partitions and wall linings were used in all the toilet rooms and in the barber shop.

THE CAWTHON HOTEL

This hotel is a fireproof structure, with reinforced concrete floor systems. Its seventh story, however, is of reinforced concrete throughout. The finish for the exterior is of grey Georgia granite for the first story, with the remainder of the building in mottled brown pressed brick with trimmings of terra-cotta. The floors throughout are of tile and concrete, and the trim is of marble and oak. There are two Otis passenger elevators and one service elevator.

The Cawthon Hotel in Mobile, Ala., was designed by Hutchisson & Denham. The Noelke-Richards Iron Works supplied the structural steel, and the Northwestern Terra Cotta Company supplied the terra-cotta. P. and F. Corbin hardware was used, and the hotel silver was supplied by the R. Wallace & Sons Manufacturing Company.

THE SPENCER VACUUM CLEANER MACHINE IN THE HOTEL TAFT.

THE HOTEL TAFT. A TYPICAL STORY PLAN.
F. M. Andrews & Co., Architects.

THE HOTEL TAFT THE BARBER SHOP AND A LADIES' RETIRING ROOM.
Walls and Partitions of "Vitrolite," Making a Glass Lining.
Made by The Vitrolite Co.

THE KITCHEN OF THE HOTEL TAFT.
Kitchen Equipment: Bramhall-Deane Co.
Ice Cream Freezer: Emery Thompson Machine & Supply Co.

THE LEAMINGTON HOTEL

The Leamington in Minneapolis, Minn., is distinctly an apartment hotel. It contains 850 rooms, besides the extensive public area on the first floor and the spacious roof garden. Its main frontage is about 330 feet.

The general contractors and engineers for the Hotel Leamington in Minneapolis, Minn., were the Leonard Construction Company. The interior trim and woodwork was done by the Cream City Sash and Door Co. John S. Bradstreet & Co. did the decorations, ornamental glass work, and supplied the draperies, furniture and rugs.

Exterior terra-cotta was furnished by the Northwestern Terra Cotta Co., and metal lath by the Berger Manufacturing Company. The fire protective system is thorough. Gould pumps are employed.

The hotel silver was designed and made by the International Silver Company.

THE GEORGIAN TERRACE HOTEL

W. L. Stoddart was the architect of the Georgian Terrace Hotel, in Atlanta, Ga. The hotel is located at the corner of Peachtree Street and Ponce de Leon Circle. It is ten stories in height, and contains more than 300 rooms. By locating the building 25 and 13 feet respectively from the two streets, within the lot line, it was possible to preserve the shade trees on the street fronts and improve the setting of the building. A 12-foot terrace extends along the frontage on both streets, which forms an outdoor dining room in connection with the main dining room. This latter has a seating capacity of 350 guests. It is 44 by 90 feet, and has a ceiling 20 feet in height. The plan explains the arrangement of the typical upper floors, and shows the court separating the building into two wings, thus providing ample ventilation during the hot weather. The George A. Fuller Company were the builders, and the Federal Terra Cotta Company supplied the exterior terra-cotta. The front brick was supplied by the Hydraulic-Press Brick Company. The wire for the hotel was supplied by the Habirshaw Wire Company. The structural steel work was done by the Noelke-Richards Iron Works. Jacob & Josef Kohn supplied bentwood furniture.

THE CHATEAU LAURIER

The Chateau Laurier was designed by Ross & MacFarlane, and built by the George A. Fuller Company. The engineers were Westinghouse, Church, Kerr & Co. The exterior is built of Indiana limestone, which came from the quarries of the E. F. Giberson Company, Bedford, Indiana. The McFarlane-Douglas Company, Ltd., constructed the roof, which is of 16-oz. cold rolled copper. This company also supplied all doors and grill work about the elevators and many kalameined doors and windows. The foundations, waterproofing and galvanized steel ventilating pipes were also included in their contract. Enameled brick was supplied by the American Enameled Brick & Tile Company. The Linde Canadian Refrigeration Company, Ltd., installed the ice machines, and the refrigerators were made by the White Enamel Refrigerator Company of New York.

The interior marble, mosiac and tile work was done by the Smith Marble & Construction Company, Ltd. P. and F. Corbin supplied the hardware, and the Tiffany Studios did the bronze work. The interior decorations were done by the Bell Galleries in Toronto, and Jacob & Josef Kohn supplied bentwood furniture.

HOTEL JEFFERSON, ST. LOUIS, MO.

Barnett, Haynes & Barnett, Architects.

Bulletin Board: U. S. Changeable Sign Co.
Ornamental Iron and Structural Steel: Noelke-Richards Iron Works.
Evans' "Crescent" Expansion Bolts Used.

THE CAWTHON, MOBILE, ALA

Hutchisson & Denham, Architects.

Terra-Cotta: Northwestern Terra Cotta Co
Structural Steel: Noelke-Richards Iron Works.

THE CAWTHON HOTEL. THE VINEYARD CAFE AND THE MISSION LOBBY.

Hardware: P. & F. Corbin. Hutchisson & Denham, Architects.
Silver Service: R. Wallace & Sons Mfg. Co.
Otis Elevators.
Stanley Ball Bearing Hinges.

HOTEL JEFFERSON ROTUNDA AND MAIN RESTAURANT.

Otis Elevators. **Barnett, Haynes & Barnett, Architects.**
Ornamental Iron and Structural Steel: Noelke-Richards Iron Works.

A CORNER OF THE MAIN RESTAURANT WHICH SEATS 486 PEOPLE.
Silver Service: International Silver Co.

THE LEAMINGTON HOTEL, MINNEAPOLIS, MINN
General Contractors and Engineers: Leonard Construction Co.
Metal Lath: Berger Mfg. Co.
Terra-Cotta: Northwestern Terra Cotta Co.
Pumps: The Goulds Manufacturing Co.
Draperies and Ornamental Glass: John S. Bradstreet & Co.

THE LEAMINGTON. THE BALL ROOM OR TEA ROOM AND THE LOUNGE.

General Contractors and Engineers: Leonard Construction Co.
Decorations, Furniture, Rugs, etc.: John S. Bradstreet & Co.
Interior Trim and Woodwork: Cream City Sash & Door Co.
Silver Service: International Silver Co.

GEORGIAN TERRACE. GROUND AND TYPICAL STORY PLANS.
W. L. Stoddart, Architect.

GEORGIAN TERRACE, ATLANTA, GA

Builders: George A. Fuller Co W L. Stoddart, Architect.
Structural Steel: Noelke-Richards Iron Works.
Face Brick: Hydraulic-Press Brick Co.
Terra Cotta: Federal Terra Cotta Co.
Insulated Wire: Habirshaw Wire Co.
Otis Elevators.

GEORGIAN TERRACE. THE MAIN LOBBY AND THE MAIN DINING ROOM.
Bentwood Furniture: Jacob & Josef Kohn. W L. Stoddart, Architect.

THE EMERSON HOTEL

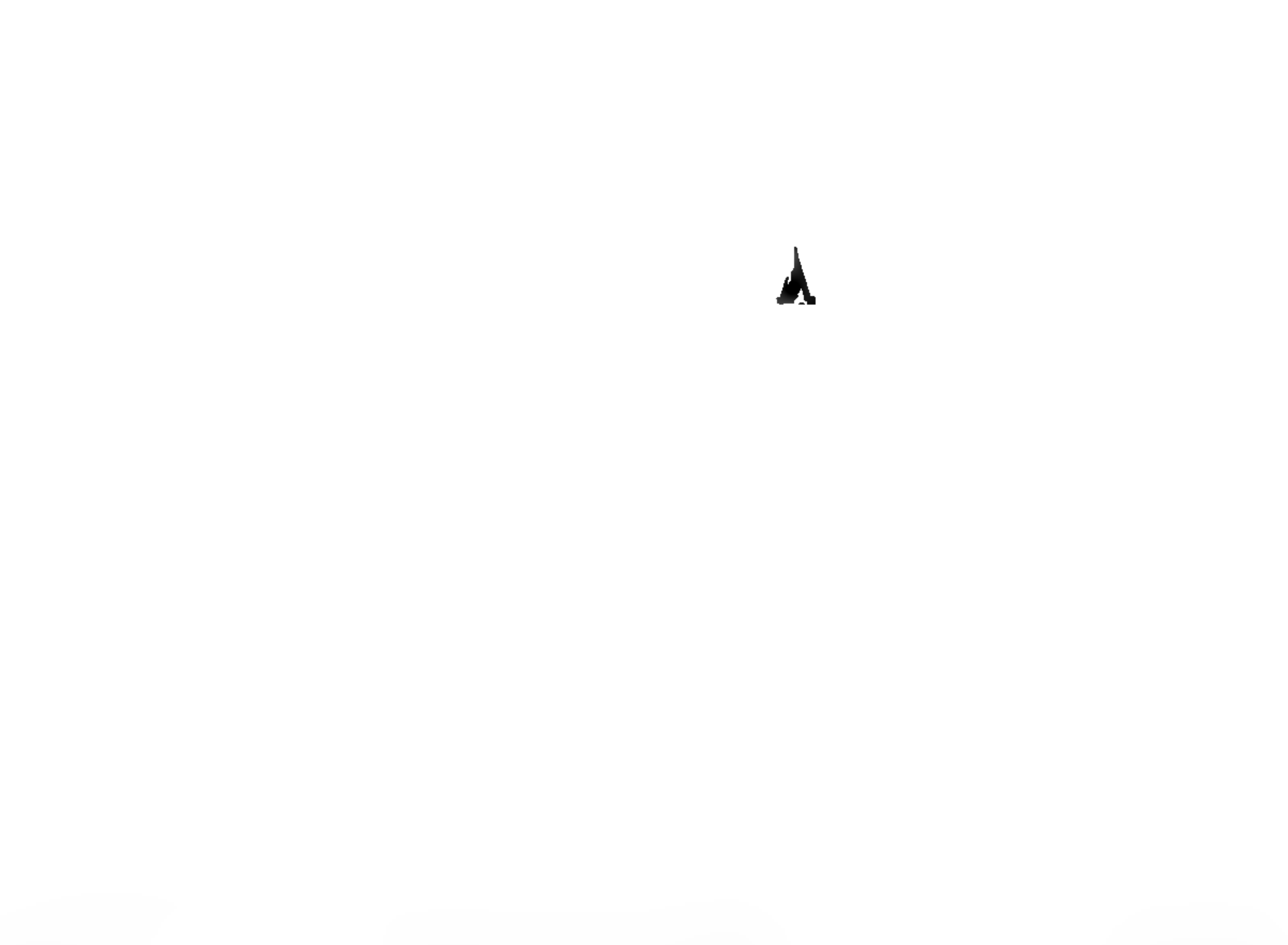
The Emerson Hotel, Baltimore, was designed by J. Evans Sperry. William H. Parker was the builder of the hotel, and Henry Adams was the consulting engineer. The terra-cotta was made by the Conkling-Armstrong Terra Cotta Co.

In the interior, the ornamental plastering was done by the Architectural Plaster Company, the lighting fixtures were designed and made by the Mitchell Vance Company, the hardware by P. and F. Corbin, and all of the interior woodwork was manufactured and erected by the Robert Mitchell Furniture Company. The hotel silver was produced by the R. Wallace & Sons Manufacturing Company.

The filter plant for the hotel was built by the Loomis-Manning Filter Distributing Co.

The photographs of the Emerson Hotel were made by Holmes & Bishop, of Baltimore.

THE CHATEAU LAURIER. A PRIVATE DINING ROOM.
Interiors: Bell's Galleries. Ross & MacFarlane, Architects.
Decorations: Tiffany Studios.



THE CHATEAU LAURIER, OTTAWA, CANADA

Builders: George A. Fuller Co.
Limestone, E. F. Giberson Co., Bedford, Ind.
Copper Roof, McFarlane-Douglass Co., Ltd
Enameled Brick American Enameled Brick & Tile Co.
Interior Marble, Mosaics & Tiles. The Smith Marble & Construction Co., Ltd
Otis Elevators

Ross & MacFarlane, Architects
Westinghouse, Church, Kerr & Co., Engineers.

THE CHATEAU LAURIER PERSPECTIVE AND PLAN.

Ross & MacFarlane Architects.
Westinghouse, Church, Kerr & Co., Engineers.

Limestone: E. F. Giberson Co., Bedford, Ind
Hardware: P. & F. Corbin.
Metropolitan Detachable Mechanism Push Button Switches.
Ice Machines Linde Canadian Refrigeration Co., Ltd.
Refrigerators: White Enamel Refrigerator Co of N. Y
Metal Doors, Windows and Trim: McFarlane-Douglas Co., Ltd
Bentwood Furniture: Jacob & Josef Kohn. Evans' "Crescent" Expansion Bolts Used

THE CHATEAU LAURIER MAIN STAIRCASE AND MAIN DINING ROOM.
Interiors: Bell's Galleries. Ross & MacFarlane, Architects.
Decorations: Tiffany Studios.
Interior Marble, Mosaics and Tiles: The Smith Marble & Construction Co., Ltd.

HOTEL ADOLPHUS. MAIN DINING ROOM.
Barnett, Haynes & Barnett, Architects.
Designed and to be executed by W. P. Nelson Company.

THE CHATEAU LAURIER. THE LOUNGE.
Interiors: Bell's Galleries. Ross & MacFarlane, Architects.

HOTEL ADOLPHUS, DALLAS, TEXAS.

Barnett, Haynes & Barnett, Architects.

Ornamental Iron and Structural Steel: Noelke-Richards Iron Works.
Hollow Metal Doors and Trim: Dahlstrom Metallic Door Co.
Interiors: W. P. Nelson Company.

Photographs by Holmes & Bishop.

THE HOTEL EMERSON, BALTIMORE, MD.

Builder: Wm. H. Parker. J. Evans Sperry, Architect.
Otis Elevators. Henry Adams, Consulting Engineer
Loomis-Manning Filters.
Star Expansion Bolts Used.
Venetian Blinds James G. Wilson Mfg. Co.
Terra-Cotta: Conkling-Armstrong Terra-Cotta Co.
Interior Woodwork Manufactured and Erected by The Robert Mitchell Furniture Co.
Metropolitan Detachable Mechanism Push Button Switches.

THE HOTEL EMERSON. THE DINING ROOM.

actured and Erected by The Robert Mitchell Furniture Co.
& Sons Mfg. Co.
itchell Vance Co.

tectural Plaster Co

J. Evans Sperry, Architect.
Henry Adams, Consulting Engineer.

THE HOTEL EMERSON. THE LOBBY.

Interior Woodwork Manufactured and Erected by The Robert Mitchell Furniture Co. J. Evans Sperry, Architect.
Lighting Fixtures: The Mitchell Vance Co. Henry Adams, Consulting Engineer.
Hardware: P. & F. Corbin.
Ornamental Plaster: Architectural Plaster Co.

THE HOTEL EMERSON THE BALL ROOM AND THE RATHSKELLAR.

Silver Service, R. Wallace & Sons Mfg. Co. J. Evans Sperry, Architect.
Interior Woodwork Manufactured and Erected by The Robert Mitchell Furniture Co.
Lighting Fixtures: The Mitchell Vance Co.
Hardware: P. & F. Corbin
Ornamental Plaster: Architectural Plaster Co.

THE FIREPROOF HOTEL

A PRACTICAL IDEAL

By EDWIN O. TORBOHM.

SUCCESSFUL hotel managers may be, and probably are born, rather than made. Hotel structures, however, are still made in the old fashioned way by the judicious combination of brain and brawn in the use of various building materials. The peculiar fitness of the more successful of the nations' hostelries has come about not by accident but through a proper appreciation upon the part of those charged with the prepara- of the plans, of the needs and requirements of the prospective occupants.

The modern, up-to-date hotel is "fireproof," that is to say built of fireproof material; but it does not necessarily follow that the structure is fire-resistive even to a moderate degree. The arrangement of the various parts may be so faulty that hardly any distinctive fire-resistive qualities are exhibited when the building is subjected to a serious test. The plan and arrangement then may make or mar our "fireproof" building according to the degree of intelligence with which the architect has approached his subject and the skill, or the lack of it, with which he has anticipated the various contingencies that may arise.

For the purpose of this necessarily brief paper let us assume that all the essentials of a thoroughly safe and a properly fireproofed structural creation are before us. In such a building the foundations and the frame, the floor system, and the enclosing walls are all adequate for the loads expected. Wind and other stresses have been liberally estimated and provided for, all structural steel work, including that in the attics (so often neglected) is fully protected by terra-cotta or concrete fireproofing, and the room partitions, of fireproof material, are all carefully constructed, extending from one permanent floor arch or plate to the next and nowhere rest upon wood or other combustible material.

How now shall we finish this building? To have wooden floors over hollow spaces, thin panelled wooden doors between the rooms and to the corridors, wooden window sash and framing, open stairways and elevators, dummies and vent shafts or pipe and wire shafts with wooden fronts or soldered metal, would obviously not be in keeping with the excellent start we have made. What we want is a building which shall be fireproof in fact as well as in name. The perfect fireproof building will probably never be erected, since to be absolutely proof against fire from without as well as from within would require a structure so arranged as to be practically unusable and therefore economically impossible. What we can and should do, however, is to so design our building that but a comparatively small proportion of its combustible contents will at any one time be subject to the same fire. This can only be accomplished through a proper subdivision of areas by adequate fire stops both vertical and horizontal and the elimination of all combustible trim.

If our "fireproof" is to be worthy of the name let us then avoid first of all

wooden floors. Concrete floors are cold only in cold buildings—never in hotels. So we will fasten our rugs directly to the waterproofed concrete surfaces and enjoy both greater safety from fire and better sanitation. Drawn steel or kalameined wood provides us with doors and room trim which, when properly treated, rivals the natural woods in beauty of finish, so why temporize with the non-fireproof trim in a "fireproof" building? Not merely the room doors leading to corridors, but *all* doors should be of incombustible material, which means that those connecting suites of rooms should be of this type. Mere "fireproof" construction will avail but little if the vast quantities of highly combustible contents which is a necessary concomitant of the large hotel are not in some way divided up into comparatively small and to that extent safer groups.

In the general plan interior shafts or fully enclosed light courts should be avoided; likewise interior vent shafts. All these act like flues or immense chimneys and frequently carry otherwise insignificant fires beyond bounds. Where the vent shafts can not be avoided four inches of brick, terra-cotta or concrete should be the minimum thickness of the enclosing walls and all openings into them protected by riveted metal louvres or wired-glass in kalamein or metal sash, automatically closing, in case of fire, through the use of fusible links.

No feature of internal arrangement is of more vital importance in a hotel than the proper and adequate enclosure of the various agencies through which communication is had from floor to floor. Stairways may be of sufficient width and strength and absolutely unburnable, but unless they are properly enclosed they will avail but little as means of safe egress under trying conditions. A compeling desire to care first for the safety, comfort and convenience of his guests is characteristic of every successful hotel man. To have the guests needlessly alarmed even although no danger threaten is a thing to be shunned. Smoke communicating from floor to floor may cause quite as truly a loss as if fire spread throughout the same area. The natural tendency of fire and smoke being upward, stairways, elevators, dumbwaiters, etc., should therefore not only themselves be of fireproof material, but the entire enclosure, including the covering of such openings as may be required, should also be equally fire resistive. Unenclosed or surrounded by only partially fire-resistive material these will serve as ready means for the rapid spread of both fire and smoke. A standard arrangement consists of enclosure in six-inch terra-cotta blocks or poured concrete or their equivalent with all openings in the same closed by doors of drawn or pressed sheet steel or kalameined wood, with or without wired-glass panels as may be preferred. Sash, if any, should be similar material.

Elevators should be arranged in like manner, and where a maximum of safety is desired, elevators and stairways should be in separate shafts. In large establishments, where a number of stairways and elevators are installed, a battery of elevators may be located adjoining a staircase and the entire outfit enclosed in a thoroughly fireproofed vestibule with doors as indicated above. Such an arrangement can be approved, however. only for shafts not extending into the basements or other hazardous portions of the house. Nor can double-acting swinging doors, or, in fact, any door without fastenings be approved, since these offer little resistance to the passage of strong drafts of air.

Frequently treated as of secondary importance, but erroneously so, are service dummies. These should have as effective

protection as elevators and every effort should be made to separate them entirely from the shafts used by guests, the best practice now being to have them communicate not to hallways or corridors, but to serving kitchens on the various floors.

Pipe shafts, electric light conduits and similar ducts receive identical treatment. Indirect heating and ventilating systems should connect at convenient points at each floor with substantial brick, terracotta or concrete flues equipped with dampers so that portions may be entirely shut off when required. In this connection it may not be amiss to refer to the accident which recently befell a prominent New York City hotel. Through the burning of a quantity of rubbish from a demolished building, adjoining and close to the intake of a fresh-air circulating suction fan, a great volume of smoke was drawn into and distributed throughout the dining room at the dining hour. Aside from the annoyance and discomfort of the guests, who were compelled to vacate for the time being, there accrued an additional loss through the soiling of wall and ceiling decorations and draperies. This accident illustrates the care with which many of the details of arrangement ought to be studied. Had the fresh air intake been located higher it is unlikely that damage would have resulted. All air circulating systems ought to be equipped as a matter of safety with readily accessible dampers at convenient locations, and provision should also be made for the prompt shutting off of power to suction fans or blowers at one or more points other than at the device itself.

Before leaving the question of floor openings a word as to window protection is necessary. Where the neighboring buildings are of sufficiently hazardous nature to warrant consideration as exposures, all windows facing or over the same must be protected against the ingress of fire. Exposure hazard as interpreted by the fire prevention engineer is a subject too extensive to enter into here, but a hint of the generally accepted standards of protection is given. Thin sheet iron shutters are of but slight value and except the exposure be extremely mild windows of kalameined wood with wired-glass are likewise not recommended. For a moderate exposure wired-glass in hollow metal sash and framing is a standard protection; for more hazardous exposure standard metal clad, shutters are required. Where full protection is desired on the windows in rear courts or ells of the building which are exposed only to their own hazard, wired-glass in metal or kalameined sash should be used. Even if not all of the windows are so equipped those directly opening from stairways, corridors or other exits, should be thus protected to the end that these passages may be reasonably safe against the entrance of smoke and flame.

Especial care is required in the arrangement of the sub-grade floors. Kitchens, storerooms, bake and pastry shops, silver polishing, laundry, carpenter and pipe fitting shops, furniture repairing or upholstering and similar hazards are with few exceptions located here. In addition to the above there are boilers, engines and dynamos, pumps and ice machinery, as well as fuel below grade in the average hotel. All these should be segregated as thoroughly as may be, and the space allotted to each made as small as is consistent with safety and the needs of the department. Here, if anywhere, stout dividing walls and partitions are required and even if there are no fireproof doors in other parts of the house they are a prime requisite here. The stairways, dumbwaiters and all other vertical floor openings which connect the sub-grade floors with the upper portions of the hotel should be particularly well enclosed in fireproof material with fire-

proof doors. Even in the smaller establishments there should never be less than two separate and distinct stairways to the lower levels, so that a fire may be properly approached from more than one direction.

Hoods over kitchen ranges and broilers are designed primarily to carry off smoke and odors. Opinions may differ as to whether these should be connected to flues of metal (left bare or covered with asbestos) encased in brick or terra-cotta shafts and retained upon the inside of the building or whether they should be wholly outside. Convenience or inclination may decide, it matters little. About the necessity of safe insulation of these vent flues, there can be no question, however, since even with the best of circulation it seems impossible to wholly avoid the condensation of vaporized grease within them. They should be so substantially made and riveted that fire, whether accidental or designed, (they are frequently cleaned by being set afire) may be safely confined therein. Where such vents extend in a horizontal direction for any considerable distance, cleaning out doors should be provided at intervals of from twelve to fifteen feet.

It will be found a good plan to segregate as much as possible the refrigerating machinery from the kitchen, the butcher shop and storerooms or any other departments the stoppage of which may cause discomfort and inconvenience to the management or its guests. Convenience and perhaps economy suggests that the ice machine be located in or close to the engine and boiler rooms, but accidents do happen even in well-regulated hotels and ammonia does escape. At such times it will be worth many times its cost to have some special means of tightly closing, as well as quickly ventilating the refrigerating machine room.

Then there is the problem of rubbish disposal, and it is a problem of no mean proportions in many establishments. By far the best solution lies in the installation of a special rubbish chute. This may consist of a sheet metal lining to a brick, terra-cotta or concrete shaft with all openings to it protected by self-closing, vertical (lifting) doors of not less than one-quarter inch boiler plate or its equivalent. The rubbish chute should terminate in a fireproof baling room, entrance to which is gained through a fireproof vestibule. All openings here should be protected by standard metal clad doors closing automatically through the melting of fusible links. The necessity for similar chutes for linen may not be so apparent, but their installation is a refinement which will make for increased efficiency and yet cost but little when incorporated in the original plans. Instead of being baled for shipment all rubbish may be consumed in an incinerator located in the boiler room or in a specially designed compartment cut off by fire doors.

Like the service dumbwaiters, service stairways and elevators are frequently treated as of secondary importance, while as a matter of fact they are much more important from the standpoint of fire prevention than are those intended exclusively or largely for guests. Temporary storage of rubbish and soiled linen (sometimes where chutes have been provided) is frequently noticed in these shafts which is an additional reason why the requirements for their enclosure should be not less rigid than those already described.

Although we may have provided both structurally and through efficient management against the dangers of fire, provision must also be made for its prompt extinguishment should it occur. First and foremost as an efficient fire extinguisher, in the opinion of the writer, is the humble fire pail. Objection is sometimes made to its unsightliness and in a hotel this is an item to be considered. The criticism may be almost wholly overcome

by placing the pails in closets along the corridors or in specially designed wall recesses along with the fire axes and hooks which are required by the fire regulations of most municipalities. Metal tanks containing six filled pails are also available and these are both sightly and sanitary.

Next in value for incipent fires is the portable three-gallon chemical extinguisher. These are particularly useful in the suppression of fires in concealed spaces or other situations not so readily reached by water from a fire pail. A goodly number of chemical extinguishers should be provided for all parts of the house. Standpipes with sufficient hose attached to thoroughly cover any point on a floor are required for larger fires. The water supply for the standpipes may be either from tanks on the roof, city water or fire pumps. The larger establishments usually combine all of the sources of supply described above, but whatever the source, the supply, to be efficient, must be ample. Except in very small establishments, the standpipes should be six inches or more in diameter (never less than four inches) and the hose two and one-half inches. Where the water for standpipes is taken from tanks used also for house purposes, an amply adequate proportion of the total capacity of the tank should be reserved exclusively for the fire lines.

To not extend the standpipe lines to the roof of a fireproof hotel is a grievous error. Outlets provided with hose properly housed should be located here as a protection against fires in neighboring buildings. In locating the fire pump it is quite necessary that some thought be given to its accessibility as well as to making suitable provision for draining the pump and boiler rooms. Here also, as in the case of standpipes and tanks, nothing is gained by niggardliness. When water for fire lines is required it is usually wanted badly and in quantities. One good sized stream, vigorously propelled is usually more effective than a half-dozen feeble streams. A large capacity pump, full sized piping, liberal steam supply, all are essential.

Automatic sprinklers are strongly urged for all work rooms, such as carpenter or upholstery shops, and in the store rooms, rubbish rooms, baggage rooms, etc. There seems to be no immediate necessity for their general introduction throughout the entire sub-grade floors, although to be sure no harm could accrue, except that as a matter of choice they had best be kept out of dynamo and motor rooms where short circuiting would follow their discharge from whatever cause. Pressed for patronage, some resourceful manager may yet equip his entire hotel with automatic sprinklers, although it is unlikely that a legitimate demand for such an installation will be formulated by the civil authorities or by the fire underwriters if the recommendations herein submitted are adhered to. An additional and very important fire extinguisher of trifling cost is available in the use of steam jets. These may be introduced into small confined spaces such as the rubbish room and are invaluable for the vent flues leading from kitchen ranges and broilers.

It is perhaps needless to add that the valves for turning on the steam must be located upon the outside of the rooms sought to be protected and in the case of flues located in readily accessible places somewhat remote from the point or points where fire is expected.

Having done all these things to guard against fire becoming unduly destructive, we want now to insure that they be maintained in an operative condition. This is best accomplished by the establishment of a fire brigade among the employees under the supervision of the chief engineer or an equally competent person.

Weekly inspection of every piece of fire-fighting paraphernalia by alternating sets of the members of such a brigade, duly recorded upon prepared blanks, will do much toward making the location of these safeguarding agencies familiar to those best qualified to use them, as well as providing against their being in an inoperative condition through neglect. Fire drills may and should be established for sub-grade floors or wherever and whenever they will not cause alarm and panic among the guests, and a sufficient number of the employees instructed in the use of the various fire appliances.

Watchmen are another feature of hotel management which must be provided for. Watchmen without watch clocks to record their rounds are not popular. The portable watchclock with key stations in connection with an auxiliary alarm system is both efficient and not costly. There are also other recording devices which signal electrically to some distant central office station at stated intervals. The latter installation is, of course, much more expensive and in the case of hotels where there are at all times a considerable number of employees about, not necessarily more desirable. The installation of auxiliary fire-alarm boxes may be upon these circuits or direct to fire headquarters. Most large establishments prefer to have all the various floor fire-alarm boxes register upon an annunciator in the hotel office, reserving the sending of the actual alarm to the judgement of the hotel management.

While some of these features, properly speaking, belong exclusively to the management, the necessity for their consideration is impressed upon the architect so that he may be enabled to provide intelligently for their execution.

BOOK REVIEWS

MOLDING CONCRETE CHIMNEYS. SLATE AND ROOF TILES. By A. A. Houghton, New York: The Norman W. Henley Publishing Company. Price, 50 cents.

This is another practical treatise by Mr. Houghton. The first part of the book treats of chimney construction, small monolithic chimneys, interlocking blocks for concrete chimneys, ornamental molds for chimneys, forms for large monolithic chimneys, etc. The author then discusses various types of concrete roofs and goes into the subject of concrete roof construction in a practical manner. Illustrations are given throughout, showing the methods and devices employed. The subject of roof loads and bearing capacity of roofs is shortly discussed at the end of the work.

SANFORD'S MANUAL OF COLOR. By John Ithiel Sanford. Price $1.00.

This is a simple treatise on the subject of the primary colors and their blending. A color chart shows the system of blending, and there is also shown a complete chart of the prismatic or rainbow colors. The arrangement of this chart shows how the three primary colors passing through a prism are combined to give the seven colors with the various intervening shades.

THE KINGDOM OF DUST. Profusely illustrated. By J. Gordon Ogden, Ph.D. Chicago: The Popular Mechanics Company. Price, 50 cents.

This little book is an interesting essay which is very well illustrated, dealing with the subject of dust in the atmosphere and the various phenomena which accompany it and are related thereto. The first chapter treats of dust in the atmosphere, or terrestrial dust; the second with cosmic dust, or the dust of the universe.. Further chapters treat with the injurious substances which are carried by dust, from inorganic poisons to the organic poisons of the molds and bacteria.

A PRACTICAL MANUAL OF STEAM AND HOT-WATER HEATING. By Edward Richmond Pierce. First Edition. Chicago: The Domestic Engineering Co. Price, $2.50.

In reviewing this book, a great recommendation for it is the knowledge and experience of the author. Mr. Pierce has devoted the energy of a long and active business life to the study of heating conditions and the scope of his activities has covered a great range of territory. He has familiarized himself with heating conditions as they apply locally in all sections of the United States. Connected as he has been with the American Radiator Company, he has been able to study the conditions of manufacture as well as those of installation, and his treatment of the subject of steam and hot-water heating is a broad and liberal one.

The book is written in the simplest language and it should do much to increase the demand for reliable and efficient heating apparatus. The author has patiently drilled through every problem ordinarily met with in estimating and installing heating apparatus under various conditions.

CONSTRUCTIVE CARPENTRY. By Charles A. King. Published by the American Book Company, New York. Price, 70 cents.

This is the third book of King's series in woodwork and carpentry, and it is particularly intended for students in technical, industrial and trade schools, who have advanced beyond the work as outlined in the previous elementary volumes. The subjects treated are those which would be of greatest value to the prospective and the finished workman. The book consists of a series of problems which arise in the different stages in the construction of the shell of a house, until it reaches the point where it is ready for the inside work. Special attention is given to the use of the steel square in framing roofs and the methods by which the angles of the different cuts and the lengths of the rafters and other members of the frame of the house, may be found. The chapters of the book include masonry foundations, with instructions concerning the laying out of building sites; forms of construction, which cover the various methods of framing; mill construction; the carpenter's steel square and carpenter's geometry, which is a new method of presenting the use of the steel square; roof construction, which is treated in considerable detail; boarding in and outside finish; roof coverings; and plastering, which includes methods of lathing. There is a glossary of terms used in carpentry, and an index.

THE ESSENTIALS OF LETTERING. A Manual for Students and Designers. By Thomas E. French and Robert Meiklejohn. Third Edition, revised and enlarged. Published by the McGraw-Hill Book Company, New York. Price, $1.00.

This book, which is now in its third edition, contains an historical outline of lettering, chapters on letter construction, composition and titles, selection of style, letters in design, design and composition, monograms, ciphers and marks, drawing for reproduction, and a bibliography of the subject. The chapters on design and composition, and monograms, are particularly interesting and useful; while to the student of the subject of lettering, the bibliography is an exceedingly valuable addition.

Art and Architecture

At the March meeting of the Philadelphia Chapter A. I. A., Mr. Crane of the committee on biography and history, issued a further request for members to fill out biographical blanks in order to complete the files of the committee. Besides the personal advantage of having such records in hand, there is an advantage to the profession at large, and, we might say, the community at large, in recording the life work of architects. In a sense such a collective biography is a history of the national building development and our civic monuments. Every architect should be interested in this movement and it is one that is worthy of emulation by all other chapters of the Institute and the various architectural clubs throughout the United States.

In furtherance of the discussion at the February meeting, a committee on practice was created, which is to prepare a revised schedule of charges for the Philadelphia Chapter. In view of the creation of this new committee, Mr. D. K. Boyd moved that it should also be charged with the preparation of the documents which he had advocated at the last meeting, namely, a form of understanding, not agreement, between the client and the architect, setting forth the principles of practice, a combination as it were of the schedule, the code of ethics and the code of competitions, the same to be incorporated, if favorably considered by the committee, with the proposed chapter schedule. The motion was adopted.

COURSES IN ARCHITECTURAL DRAFTING AT THE MECHANICS' INSTITUTE

The General Society of Mechanics and Tradesmen of the City of New York presents the following architectural courses in their school department: an elementary course for beginners which includes preliminary work in projects and detail drawings of various structural features; a second year course which takes up plans and elevations for frame houses and further details; a third year course which covers the plans, elevations and details of city buildings. There is a fourth course in estimating for builders, and a fifth course in advanced estimating. To graduate in architectural drafting, the student must have taken the first four courses and must have a knowledge of arithmetic through square root.

TO COOPER UNION GRADUATES

The erection of the "Hewitt Memorial Building" cannot fail to be a matter of deep interest to every graduate and former student of Cooper Union. The complete project is a six-story and basement building, but lack of funds prevents the trustees from building more than the basement and two stories at the present time.

The executive committee of the General Alumni Association, feeling that the graduates would desire in some way to contribute to the building, have asked the director how they might best co-opèrate, and received in reply the suggestion, approved by the trustees, that the alumni might undertake to decorate and furnish the room on the first floor of the building, to be known as the Students' and Graduates' Room.

Further particulars can be obtained by writing to the Cooper Union Alumni Association.

In the January issue of the Quarterly Bulletin of the American Institute of Architects, there appears an article on the American Academy at Rome, by Glenn Brown, which is splendidly illustrated from a fine series of photographs. The issue on this account will be of wider interest and will be valued by many besides Institute members.

The Mayor of Pittsburgh has recently appointed a city planning commission and an art commission. Many matters of interest to Pittsburgh will be taken up by these two commissions and municipal improvement should follow. The plan for the river-front improvement which includes a levee along the Ohio River is part of the scheme of development in the hands of these commissions. The new building projects in Pittsburgh include the erection of a new hotel on the site of the old Colonial Hotel, and a new theatre which will be located on Forbes Street, and a new building for the East End Savings and Trust Company.

The Housing Committee of the Pittsburgh Chamber of Commerce has recently presented a report urging the erection of small, sanitary dwellings for working people, at a cost of from $1,600 to $2,000. It is apparent that these buildings are intended to be built in large groups, thus reducing the unit cost. We quote from the report:

"We find the proposition for single dwellings preferable over tenements. It is, therefore, toward the single dwelling, we desire to guide the sentiment of our builders. There is an urgent need in Pittsburgh for a large number of small sanitary workmen's dwellings that may be rented for approximately $12 to $25 a month."

Holabird & Roche, who have for long been located in the Monadnock Block, Chicago, Ill., announce that they will, on May 1, 1912, move to offices in the new Monroe Building, 104 South Michigan Boulevard, corner of Monroe Street, Chicago, Ill.

An exhibition of 28 water color paintings by Walter L. Palmer is being held in the art gallery of Pratt Institute, Brooklyn, N. Y. This will close on April 27th.

ELECTRIC POWER ON THE FARM.

Bulletin No. 25 of the Engineering Experiment Station of Iowa State College bears the title "Electric Power on the Farm" by Adolph Shane. The paper is very concisely handled and is an exhaustive document. It deals with electricity in the house, electricity in the barn and the use of electric power about the farm land. The bulletin is equally applicable to the use of electricity on a country estate and with both illustrations and text shows the varied uses of electric power. The economic aspect is not lost sight of and the author has taken pains to tabulate the cost of current and the amount of current consumed Further, the cost of installation is gone into in great detail and wiring diagrams, plans and illustrations of equipment and power supply are given. The cost data is thorough and closely figured.

OBITUARY

WILLIAM PHYFE.

We announce with deep regret the death of William Phyfe, of P. & F. Corbin, of New York. He was a loyal friend and employe, a salesman who represented the company as well as sold its goods, and a man of sterling character who won the respect and confidence of all with whom he came in contact.

He had been identified with the company since 1852, with the exception of one brief absence. As one of the pioneers in the field, he did his part to foster the growth of the hardware industry and as an honorable, kindly gentleman he made a record in his daily life of which those with whom he associated may well be proud.

Fireproofing and Fire-Protection

MR. G. H. STEWART

CREMATION FOR THE MONTH

The aggregate fire loss for the month of March in the United States and Canada totaled $16,650,850. This loss is approximately half of the fire loss for the month of March, 1911, and several millions less than that for the month of March, 1910. Nevertheless, it is sufficient. The cause of the large fire loss in March, 1911, was the serious fire in the State House at Albany, together with several others. Some further comparisons are interesting. The total loss for the first three months of 1912 is $80,905,950. As compared with the first three months of 1911—$69,907,250—and 1910—$49,130,250—this is a very large increase and an extensive handicap for the beginning year. In the *Eastern Underwriter,* Mr. Bertram C. Scudder has figured out that at the ratio for the first two months of 1912, the yearly loss will reach the $300,000,000 mark. The March figures show a marked decrease under the figures for January and February for this year, the January loss being $35,653,450, and the February loss being $28,601,650. It is to be hoped that the loss throughout the rest of the year may tend to reduce the high averages of the first months and that the efforts of our fire-preventionists may be fruitful. We are indebted to the carefully kept records of the *Journal of Commerce and Commercial Bulletin* for the information given above.

PHILADELPHIA AND FIRE LOSSES.

Philadelphia burned up $2,185,928 worth of property during the year 1911. This was all covered by insurance with the exception of $134,400 worth. The loss in buildings amounted to slightly over half a million and the contents nearly a million and a half. The actual number of fires was 3,878 and of this number 2,857 were confined to the floor on which they started. This is surely a splendid showing and a great tribute to the city fire department.

It is interesting to note how Philadelphia is starting off a new year. In the month of January there was a $200,000 damage in a moving picture film factory. February started in promptly with a loss which was roughly estimated at $800,000 in a fire which destroyed three large factory buildings. The outlook is not promising for 1912, and Philadelphia will have to reduce its monthly average materially to come within the limits of 1911.

(Continued on page 24)

THIS FIRE COST $750,000

Five large structures were destroyed, including a church and four manufacturing buildings.

It would have been prevented

If the architects of these buildings had taken precautions to preserve their creations by equipping them with

These automatic sprinklers not only catch the fire at the start and put it out before it becomes dangerous, but also, by virtue of their ability to do this, command enough reductions in insurance premiums to pay for themselves in about five years. After this period the reduction in premiums is clear gain.

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However, Philadelphia takes quick action and, as the result of a conference held by Director Porter of the Department of Public Safety, Charles A. Hexamer, secretary of the Fire Underwriters' Association, Dr. Jesse D. Burks, Director of the Bureau of Municipal Research, and Fire Marshal Lattimer, Mayor Blankenburg of Philadelphia will be asked to appoint a commission to investigate fire causes and prevention in that city.

THE HAZARD OF THE MOVING PICTURE FILM.

City officials in Philadelphia have demonstrated by actual experiments the highly inflammable nature of moving picture films, which, it was shown, would explode or burst into flame when exposed to a temperature of about 300 degrees. An overheated steam pipe, it was claimed, would be sufficient for such purpose.

Overheating of films from steam pipes was the cause which was suggested for the fire which occurred on January 13th in Philadelphia, causing a $200,000 damage to a moving picture film plant and theatre. The experiments referred to above were conducted in the office of Fire Marshal Lattimer at City Hall by William McDevitt, chief inspector for the Philadelphia Fire Underwriters' Association; Assistant Director Murphy, of the Department of Public Safety; Chief Fire Inspector Baxter, Harry Schwable, manager of the General Film Company in whose building the fire started, and other film manufacturers.

MARCH FIREPROOF DIGEST.

In reviewing the "Fireproof Digest" for March, we can report progress. The article on the "World's Waste by Fire" is continued, and also that on "Electricity for Buildings." A very interesting article on the "Press and the Publisher" deals with the big advertiser and the publisher.

A COMMENT.

That the big advertiser owns the publisher is one way of looking at it. This may very well apply to the daily press, but as far as the class magazine is concerned we believe it is true that these are largely owned not by the big advertiser, but by the subscribers or the class to which they appeal. Our lumber papers are bitter against the introduction of steel cars. They cater to both the subscriber and the ad-

(*Continued on page* 26)

vertiser; very often with biased opinions. Our engineering press is swayed by the inertia of engineering opinion. It stands pat on that and resents intrusions of new ideas. Our architectural press is very touchy on the subject of design and the pre-eminence of the architect. But these are the subscribers and not the advertisers, and on the whole the magazine editor is less restricted than the editor of the daily press. He is not controlled by the big advertiser and he can afford to tell the truth—the whole of it—More often than can the editor of the daily press.

Cincinnati is making use of her firemen as fire-prevention inspectors. It is now part of a fireman's duty to inspect houses in the immediate neighborhood of his station. Printed blanks are provided for the gathering of data concerning the condition of every building in Cincinnati from the standpoint of fire danger and sanitation. The firemen are making these inspections and their reports are submitted to the chief of the fire department. The latter, under the Mayor's instruction, will then notify the owner or occupants of such houses as may be necessary to clean the premises of anything that may tend to endanger the house. Accumulations of rubbish in cellars and attics are to be ordered out. Explosives or inflammables that may be on the premises will be ordered removed. Changes will also be ordered in the arrangement of goods of business houses so as to provide reasonable access in case of fire.

FIRE PREVENTION: AN INSURANCE REVIEW

With February, the first issue of this publication, which is the official paper of the North Dakota and South Dakota State Fire Prevention Associations, has appeared. The publication contains a number of articles and local comment, all relative to fire prevention and insurance

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FIRE BUCKET TANKS.

Among the proverbs which have grown venerable with age and hoary with time, the proverb, "An ounce of prevention is worth a pound of cure," is one of the very oldest, and so far as the writer's knowledge goes, this proverb advocating forethought and advance prudence has only one senior and that one is the story of the Biblical Maidens who filled their lamps with oil against the coming of the darkness The basic truth of these two old proverbs still remains true, and forethought and advance prudence are quite as valuable factors in human life as ever they were. In no better way is it exemplified than in the making of advance preparations to cope with that dread enemy of man, Fire. Some highly ingenious

(*Continued on page* 28)

examples of man's inventive power, as directed towards fire prevention, are to be found in the varying types of the sprinkler system family, but as sprinkler systems and other mechanical devices are not always available, some simpler method of preparing for an unexpected fire must be found, and the best method is the old, but very frequently effective, fire bucket. While it would seem that but little improvement could be made upon so simple a thing as a fire bucket, yet an astonishing improvement has been made, as demonstrated in the Safety Fire Bucket Tank, which consists of a compact metal cylinder, having a lid which fits tightly and hermetically, because of a rubber ring around the top of the tank. This tank is filled with a non-freezing solution and contains six pails on the nesting principle. Each pail is fitted into the other, but protected from binding or catching by lugs on its sides and it is equipped with a weight device which causes the handle of each pail to rise as the pail above is withdrawn from the tank. The capacity of one of these tanks is 25 gallons, or enough to fill ten pails.

So successful and satisfactory has this device been found in general use, that it has been adopted by public institutions and large corporations all over the country. For instance, a recent installation of these tanks and buckets was that in the Public Dock and Ferries, 60 tanks; in the Lincoln Storage warehouse, 48 tanks; the new pier of the Jersey Central R. R., Jersey City, 40 tanks; and at the new pier, 80 North River, 15 tanks, and many others.

The Safety Fire Bucket Tank is manufactured by the Safety Fire Extinguisher Company, who for 15 years have been in business at 29 West 42d Street, but the growth and development of their business has been such, that they have lately been compelled to move to larger quarters at 291-293 Seventh Avenue, where they have an entire floor, devoted to offices and show rooms. The Safety Fire Extinguisher Company will be pleased to freely send literature, descriptive of their product, upon application.

(*Continued on page* 50)

Industrial Progress

THE NOELKE-RICHARDS IRON WORKS PURCHASES THE BROWN-KETCHAM PROPERTIES.

The Noelke-Richards Iron Works, Indianapolis, Indiana, which has built up a considerable reputation in the last ten years through large operations in the West and Southwest in the manufacture of structural steel and ornamental iron for buildings, has concluded the purchase of the two large plants of the Brown-Ketcham Iron Works, which, a year ago, went into the hands of a receiver. This purchase makes the Noelke-Richards Iron Works one of the largest manufacturers both of structural steel and ornamental iron in the country. It claims to be the largest independent manufacturer of structural steel for building purposes only, with a capacity, in its three structural plants, of from sixty to seventy-five thousand tons a year.

Its original plant is located in Indianapolis, Ind., on the Pennsylvania Railroad. One of the former Brown-Ketcham plants is located in a suburb of Indianapolis, on the New York Central system, and the second Brown-Ketcham plant is in the Pittsburgh district, at Greensburg, Pa., thirty miles east of Pittsburgh. This latter plant is of very recent construction, modern in every respect, and will bring the Noelke-Richards Iron Works into eastern territory for a portion of its business.

In connection with their Indianapolis plant, the Noelke-Richards Iron Works operates an ornamental iron department, including a foundry, in which it has executed some of the best ornamental iron work in the country. Examples of its work in this department are: The Jefferson Hotel, St. Louis, Missouri, Barnett, Haynes & Barnett, architects, which is illustrated in this issue of "Architecture & Building," and the Berkeley Galleries Building, Boston, Mass., Codman & Despredelle, architects.

VITROLITE, A SANITARY PRODUCT.

One of the most marked characteristics of our time, is the active attention we direct as a people to the subjects of sanitation and hygiene, and persons of an inventive turn of mind are continually engaged in an effort to produce something that will either add to, or improve upon our present sanitary devices. An article of this character which is of comparatively recent invention is a glass product, known as "Vitrolite," which possesses a variety of qualities which render it an extremely desirable material for an almost endless number of sanitary purposes. "Vitrolite" is of a creamy white color which will not change or vary and possesses such desirable qualities of glass as that of being non-porous, non-crazing, impervious to the attacks of acids or alkalis, non-deteriorating with age, which make it particularly adaptable to structural work for wainscoting, closet partitions, door trim, etc. For this reason "Vitrolite" has been found very desirable in bath rooms, toilets, kitchens, butlers' pantries and rooms of like character. It has also been used with great success as wainscoting for corridors, tops for tables and pantry shelves and in fact in almost any quarter where a non-porous dirt resistant material was required. "Vitrolite" will clean even more readily than ordinary window glass and presents an attractive appearance and reflects a pleasing glow either in the sunlight or under artificial light, such as electric lights, gas, etc.

Persons interested in a material of this character and desirous of obtaining a list of the many purposes to which it may be put with admirable effect, are invited to communicate with Geo. A. O'Conner, at the Fifth Avenue Building, Eastern representative of The Vitrolite Company, or The Vitrolite Company, Parkersburg, W. Va. Descriptive literature of this product will be freely sent on request.

(Continued on page 32)

TANEX GLASS.

Those who contemplate building will be interested in knowing that a "New Process" glass has been produced, known as Tanex Glass, for the manufacture of vault and sidewalk lenses.

Glass used in sidewalk light construction is subjected to abnormal strains on account of temperature changes. Previously it has been almost impossible to produce a glass tough enough to withstand these changes of temperature and the accompanying contraction of the cement on the glass in cold weather, yet Tanex glass stands this test without going to pieces.

While being tougher and stronger than the best glass formerly made, it costs no more and has all the brilliancy of a first-class glass.

Tanex Glass is the result of many years of honest, painstaking tests and experiments at very great expense, but the results that have been obtained have more than offset the time, bother and expense incurred.

It is sold at the same price as the old brittle glass that has given so much trouble on account of chipping and crazing. The Berger Mfg. Co., Canton, Ohio, are using this superior glass in all their vault and sidewalk light construction.

Mr. Eli Blount, who has been practicing architecture in Tucson, Arizona, has moved to Albany, Oregon. He is anxious to receive manufacturers' catalogues, samples, etc., at his new address.

Forest Service Circular No. 189, "Stock Values for Structural Timber," contains tables of painting tests and heat tests on green material and air-seasoned material.

Last month a meeting was held at the Municipal Art Society of New York, at which the subject of discussion was "Suggestions for the Decorations in the Washington Irving High School." It was pointed out that the Board of Education had made this building as complete and perfect a workshop as was possible. It was the purpose of this meeting, however, to suggest and if possible, to provide means for the decoration of the school building, considering it as an appropriate setting for historic decorations and commemorative monuments.

(Continued on page 34)

Architects and Builders should investigate **EVANS "CRESCENT" EXPANSION BOLTS**

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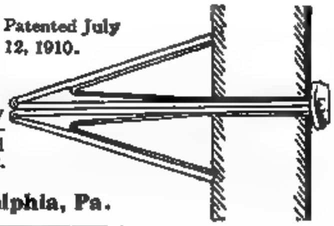

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These Nails fasten direct to Hollow Tile and save the time, expense and anxiety of preparing Fireproof Walls to receive Nailing Grounds. They do away with the necessity of burying combustible wooden nailing blocks in the heart of the wall and afford full freedom for changing plans or correcting errors in the location of interior woodwork. Also used for attaching fixtures to all types of finished hollow walls.

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Building Construction and Superintendence

Part II. Carpenters' Work — Four Dollars a Volume

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By F. E. KIDDER, C. E., Ph.D., Architect

THE WM. T. COMSTOCK CO., Publisher, 23 WARREN STREET, NEW YORK

When writing Advertisers, please mention Architecture and Building.

BOMMER SURFACE FLOOR SPRING HINGE

Bommer Brothers, of Brooklyn, N. Y., are placing on the market a new surface floor ball-bearing spring hinge, of the horizontal compression type. It fastens to the bottom corner of a door and to the surface of floor It is easy to apply, saves labor and admits of close fitting; there is no hanging strip required, and the back edge of door may be rounded. It has a simple and efficient alignment feature by which the door can be adjusted after it is in

place. It has a positive holdback when the door is opened beyond 90 degrees, so that the door will not close suddenly when it is required to have it remain open. The tension of the spring is adjustable. The spring is made of the best oil tempered steel wire. The floor plate is reinforced, eliminating a weak condition usually existing in this type of hinge The bearing surfaces are case hardened. The weight of the door is carried on hardened tool steel balls, placed at the upper part of the pintle away from dust and dirt and spaced by a ball retainer so that they cannot drop out or become displaced. Workmanship, appearance and finish are unsurpassed, and up to the well known standard of excellence always maintained by Bommer Brothers. Simple, compact and durable, this hinge ranks among the best of its class.

Mr. F. S Mendenhall, who has been employed for several years as a missionary architect and builder in western China, has been compelled to return to this country because of the revolution there. He is now visiting relatives at Security, Texas, and hopes to locate with some firm of architects in Houston, Texas.

CORK FLOORING.

Cork flooring means perhaps the greatest advance attained as yet in the art of floor surfacing, as it embodies many advantages not to be found in any other method of flooring. It has not the coldness of marble, it has not the dust and dirt collecting qualities of wood, and it has not the tendency to accumulate stains and retain them that some composition floors have. Cork flooring possesses several distinct and peculiarly characteristic qualities: it is noiseless, it is practically everlasting and will not crack or disintegrate; it requires no expensive finish or refinishing; it possesses desirable elastic qualities A floor of this material is peculiarly adapted to certain types of buildings—those designed for public speaking, or where for any reason absolute silence is desired Thus, for churches, libraries, banks, court-rooms, museums or hotel corridors this material cannot be surpassed Cork flooring may be laid with a sanitary cove and base, making it desirable for hospitals and service in clubs, hotels and dwellings.

When to these qualities we add those of non-absorption and non-slipperiness, together with the fact that the material may be obtained in a wide variety of shades, running from a delicate light brown to a rich old teak, we have a floor material which is a well-nigh ideal.

Crescent cork flooring may be obtained in a variety of stock sizes and any intermediate size can be made to order at a slight additional cost. The prices range from 65 cents to 85 cents per square foot; the lesser price being for the plain patterns in large squares, and the greater price for the more elaborate designs.

Persons interested in the subject of cork flooring may obtain descriptive literature upon application to the Hasbrouck Flooring Company at 501-9 East 70th St., N. Y. City. This concern is the selling agent for Crescent cork flooring and makes a specialty of covering cement or steel with cork or wood flooring.

The Habirshaw Wire Company announce their removal to new offices on the twenty-seventh floor of the Metropolitan Tower, New York City. They have occupied their new location since April 1st, and their new telephone numbers are 1934 and 1935 Gramercy.

Residence W. C. Sanderson, South Orange, N. J.

HOTEL EMERSON

Joseph Evans Sperry, Architect

William H. Parker, Contractor

All of the architectural woodwork and building trim in the Hotel Emerson was manufactured and erected by

The Robert Mitchell Furniture Company

Cincinnati, Ohio

Chateau Laurier, Ottawa, Canada

Bohn Syphon Refrigerator

installation in

CHATEAU LAURIER

Ottawa, Canada

illustrated in this issue

Ross & MacFarlane, Architects

White Enamel Refrigerator Co. of New York

59 West 42d Street, New York City

Recent Installations:
Grand Trunk Railroad Station, Ottawa, Canada
Ross & MacFarlane, Architects
998 Fifth Avenue, Apartments
McKim, Mead & White, Architects

FIREPROOFING AND FIRE-PROTECTION

(*Continued from page 28*)

FIRES DUE TO CARELESSNESS.

The Texas Insurance Board has tabulated the fires occurring in dwellings during the last fourteen months. It claims that 81.2 per cent were easily preventable. The tabulation of the causes of fires in dwellings is as follows:

Causes.	Per Cent.
Flues	15.5
Stoves and heating	10.0
Kerosene lamps	5.0
Curtains ignited by gas	3.1
Defective electric wiring	3.4
Coals in ashes and candles	3.4
Parlor matches	3.2
Gasoline and volatiles	3.3
Kerosene stoves	1.7

The Insurance Board says that in other fires, 65 per cent. were also easily preventable. It offers to furnish any Texas town the draft of an ordinance for fire-prevention.

In this connection, the new match bill, which it is interesting to note, has the support of the Diamond Match Company, is a step in the right direction. The bill is intended to be submitted to state legislatures throughout the country. It requires the manufacture, storage and use of only safety matches. The bill prohibits the use of the parlor match or the single-dipped, white phosphorus match and any double-dipped match that contains white phosphorus in the first dipping. It permits the use of inert bulb-guarded tip matches such as the "Marguerite"; inert bulb, ordinary tip matches, such as the "Bird's-eye" or "searchlight"; strike on the box matches, such as "Red Top"; safe guarded head single, dipped matches, such as "Lu-mets" and "Blue Diamond."

FIREPROOFING THE OPENING

In constructing "fireproof buildings," the openings are ever the weakest link in the chain, whether they be vertical or horizontal. Vertical openings, such as elevator shafts, stair wells, pipe shafts, chutes, or others, we will leave for further discussion and confine ourselves to the subject of horizontal openings—that is, doorways from space to space within the building. That these can be properly closed and at a reasonable cost is a matter of easy proof. There is no longer any excuse for not adequately fireproofing every horizontal opening in a building as long as hollow metal doors, windows and trim are obtainable. Dahlstrom hollow metal doors passed the test of the Underwriters' Laboratories in Chicago successfully and received

(*Continued on page 52*)

approval, and it is certain that they fully satisfy the claims made for them—that is, they are fireproof, satisfactory and durable for service, artistic in appearance and sanitary where this requirement is a necessity. In construction the doors are built of sheet steel, the connection between the different members being made invisible, which adds to the strength and fireproof properties of the door. The panels have an asbestos and felt lining, and the stiles have a compressed cork spacer. There is a reinforcing bar for the lock strip and hinge bar. There are large air chambers in the stiles.

The point is often raised—these metal doors will not add to the beauty of any building. This objection occurs particularly where an architect is designing a hotel or a first class office building. But if we may judge by the uses to which fireproof doors have been put, this objection can be easily answered. Fireproof doors, partitions and panelling have been put into fireproof buildings of the highest grade. Especial work has been done in imitation of wood; the finish of oak or mahogany or Circassian walnut may be perfectly imitated and the process of cold drawing the steel through dies gives well defined angles and well rounded curves in the mouldings, which are as perfect as those that may be produced by a skilled cabinet maker. Moreover, when the graining on the metal is finished, the surface is baked on, forming an enamel which is more durable than any finish on wood. Certainly it seems that the day of wooden trim is rapidly passing, and as metal trim comes more fully into use we may see a reduction in our great national fire loss.

SAFEGUARDING ART TREASURES.

The fire hazard in the Metropolitan Museum of Art, New York, is slight because of the fact that the building itself is about as nearly fireproof as it could well be made. Not only this, but much of the contents is also non-inflammable. In order, however, to complete the safeguarding of such of the treasures as would be liable to destruction or serious damage in case of fire, it has been decided to install automatic sprinklers in the basement—the place where fires in such structures are most liable to start. The management of the museum is apparently unwilling to take the chance which was taken by the State of New York in the magnificent capitol building in Albany—a chance which cost the State about six million dollars in money, and the destruction of records which can never be replaced.

The American Water Color Society will hold its forty-fifth annual exhibition at the galleries of the American Fine Arts Society, 215 West 57th Street, New York, from April 25 to May 12, 1912.

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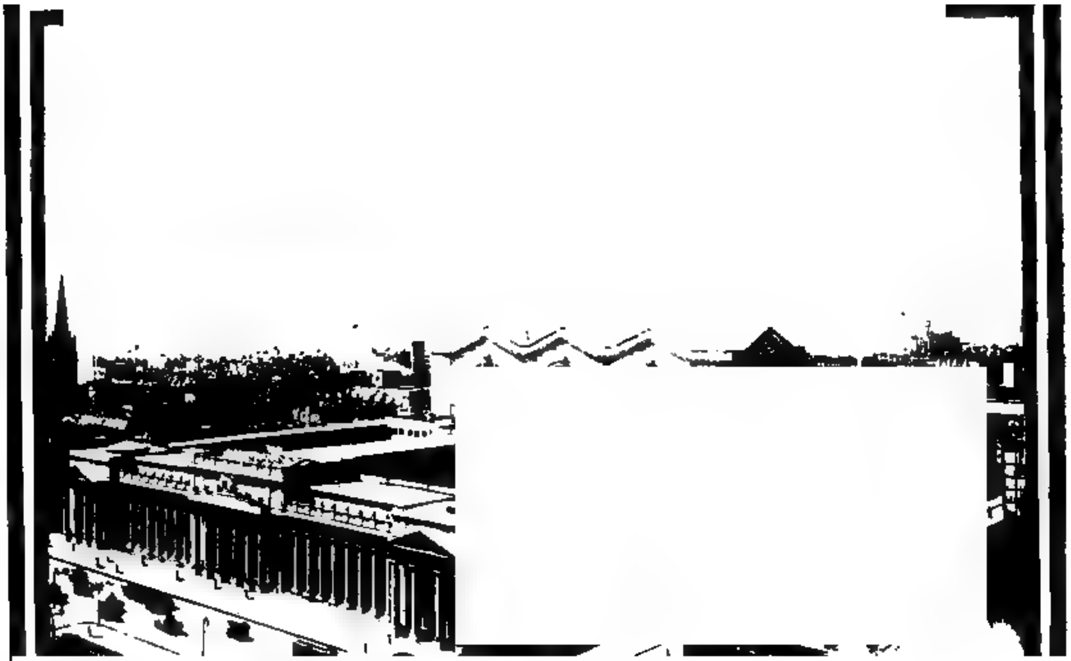

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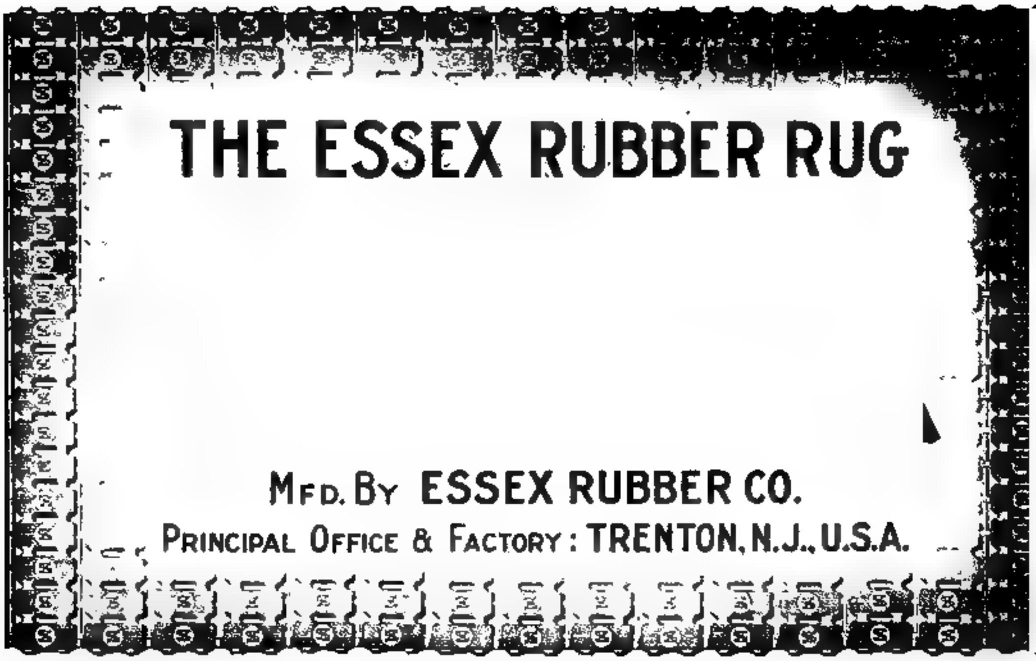
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Assisted by ALBERT BAUER

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Cross Section of Elevator Shaft and Bulkhead.

Elevator shaft construction in buildings has never before been technically treated. This book supplies the demand for information on this subject, and it has been the effort of the author to supply the necessary data for the use of the architect in placing an elevator equipment in any building. New York practice is followed, and the Building Department laws and regulations of New York are made the standard. The author has also made a careful study of the regulations in use elsewhere, giving the deviations from New York requirements. Specification writing for elevator equipment has been covered by two forms; one a simple specification for a single elevator, the other a more elaborate equipment embracing several styles of cars suitable for an office building.

The book contains most practical information and it is the hope of the author that he has omitted no important point. Every phase of the shaft problem in building construction has been covered, and the method of presentation is such that ready reference is possible to any detail of the subject.

The book is in companion size with the **Building Construction and Superintendence** Series, by Mr. F. E. Kidder.

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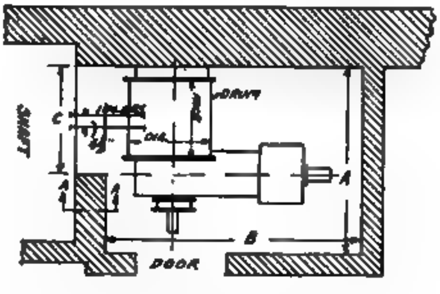

Plan of a Machine Room.

Wilson's Venetian Blinds

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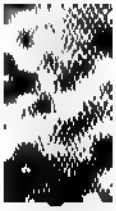
But cost no more than inferior kinds



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ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. MAY, 1912 NUMBER 5

THE HOLLOW-TILE FIREPROOF HOUSE

Article VII.—Permanent Tile Forms in Factory Construction

By FREDERICK SQUIRES

WHEN the building here illustrated was contemplated, it seemed a

supports, from an engineering standpoint, should always be heavier than the curtain

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in order to
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construc-
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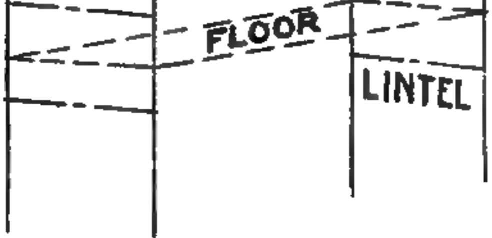
tum factory

The piers and the intervening window panels set with pivoted sash. Whitall-Tatum Co. Factory

THE INTERIOR IN THREE STAGES OF CONSTRUCTION.
Whithall-Tatum Company Factory.

A TYPICAL BAY SHOWING THE LARGE GLASS AREA AND CONCENTRATED ROOF LOADS.

makes use of the possibilities of such methods. Illustration A shows a typical bay of a factory building with no interior columns. It is obvious that the plane of the floor may be carried in any of three ways: by girders resting on columns in opposite exterior walls; by girders resting on columns in the same exterior wall; or by girders connecting all four columns.



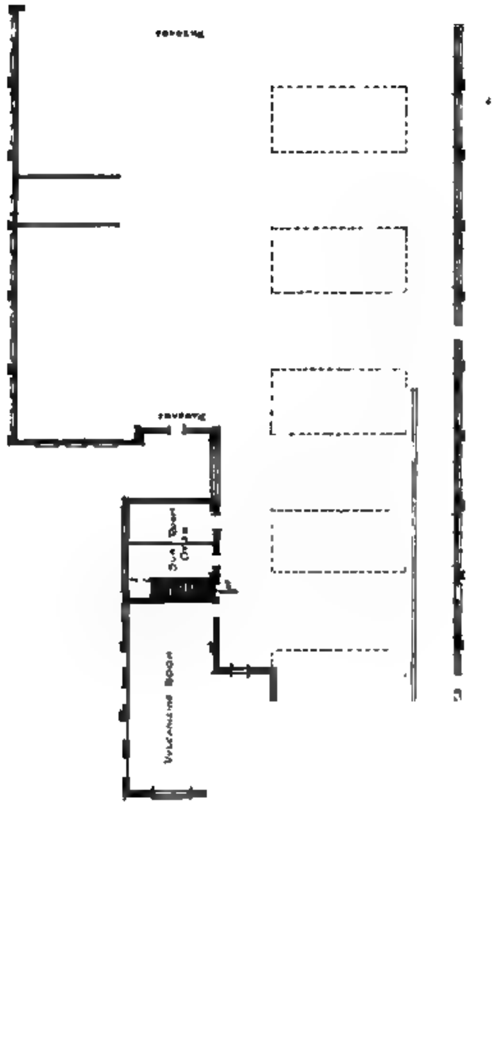
A.—SKELETON DIAGRAM OF CONSTRUCTION.

the floor load being carried on all four. It is also obvious that the floor load may be carried to the supports at the line where the floor intersects the outside wall or it may be transferred to the lintel of the window below, provided the lintel is made to extend from column to column. In either case the carrying girder may be made in permanent forms.

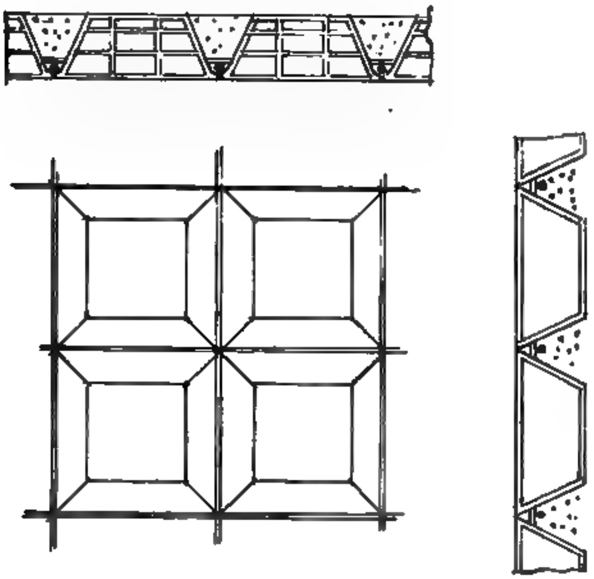
The floor itself, both one way and two ways, may be made in permanent tile forms, as follows: We will illustrate with the two-way as shown in B. Tile blocks beveled on all sides are set on temporary wood forms, side by side, and touching along their lower edges, thus forming V channels all around each block. Since the reinforcing rods must cross each other, the sides of the block for the lower rods are curved a little to give more room. The opposite sides, along which run the higher rods, are merely cut off on a straight bevel, a machine face. The concrete will not run into the open ends at more than 45°, or in the block as

WALLS LAID UP OF BLOCKS.

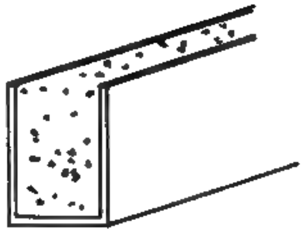
THE END WALL IN CONSTRUCTION.



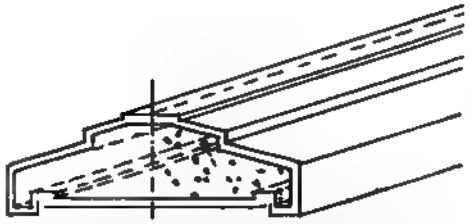
WHITALL-TATUM COMPANY FACTORY, GROUND PLAN AND THE SIDE WALL BEFORE AND AFTER IT WAS STUCCOED.



B.—TWO WAY PERMANENT TILE FORMS FOR FLOOR CONSTRUCTION.



C.—LINTEL BLOCK



D.—SILL IN PERMANENT TILE FORM. THE DOTTED LINE SHOWS WHERE THE TILE IS DIVIDED TO MAKE TWO SILLS.

shown, about an inch and a half. It is curious to note that since concrete is in compression at the top of the beam, and has little or no value in tension, in which condition it finds itself in the lower half, a beam sectioned like the above takes absolute advantage of this condition as the volume of the concrete is made to diminish exactly in the proportion in which its usefulness disappears. So much for the permanent form floor.

The lintel and wall girder for carrying the floor slabs are similarly constructed. They are merely U-shaped troughs either poured full
and set in pl
the lintel, or
in place as
girder. See

The sill,

forms, must be cast on the ground and set in place, the concrete being poured into unit tiles sectioned, as shown in the figure D. This tile will be delivered to the job with a cut at the dotted line almost through the tile, so that it may be broken into two similar pieces at that point. The channels for lintels will be manufactured with a rectangular section to be broken in half in the same way.

The following article will take up pier construction and other methods of using hollow tile permanent forms.

(To be continued.)

THE SUN DRYING ROOM.

AUTOMATIC SPRINKLER EQUIPMENT OF LOFT BUILDINGS

ARTICLE II.

By E. P. BOONE.

AMONG the first things to be considered by an architect in planning for a sprinkler equipment is the type of construction—whether the building is of ordinary, slow-burning or fireproof construction. This must be definitely settled in order that the spacing of sprinkler heads, the number of heads necessary to protect the building and contents, and the capacity of the water supplies necessary may be determined.

Having decided upon the above, next comes the questions of riser location and general layout of system, location of feed and cross mains, as well as branch lines. It should be borne in mind that provision must be made for the risers, which should be located so as to give either a centre central or side central feed to the system. Care should be taken not to locate the risers where subject to mechanical injury, and never in close proximity to a window facing a street. If located in pipe shafts, care should be taken to see that there is sufficient room to effect repairs and do painting. As the size of the riser is generally 4, 5 or 6 inches, the importance of allowing sufficient room for their proper installation should not be lost sight of. In many cases, notably in modern fireproof buildings, the risers can be located either in pipe shafts or in recesses specially constructed in the side walls, where they are out of the way, yet at a proper location. Risers, other than those supplying sprinklers in the stair shafts, which are arranged to be shut off in Winter, should never be located therein. These stair shafts, like vent shafts, are rarely heated, consequently there is always the danger of freezing in excessively cold weather. As far as is practical, the riser should be free from turns and bends and only long-turn flanged fittings may be specified. This question of riser location and protection is of vital importance if the best results from sprinklers are to be expected.

Feed mains to the risers should be planned for with the same degree of care used in laying out a high-pressure steam plant. The feed mains are the main arteries, consequently they should be allowed sufficient space in order that they may be installed without unnecessary bends and 45 degree fittings. Care should be taken to keep them out of boiler rooms and power plants, and to avoid locations where there is danger of freezing. Too often is the entire building planned, all complete, but the sprinkler equipment—one of the chief assets—is left to be installed as best it can be, at the mercy of everyone, yet the utmost service is expected of it. Pipe trenches in the basement floor, having a suitable covering for protection, as well as affording accessibility in case of repairs, are suggested as one way of overcoming some of the objections often raised, particularly that concerning loss of head room. It should be remembered that the feed mains are often 8 inches in size, and that the extra heavy fittings are often used, consequently sufficient room is needed and must be arranged for in order to run the pipes in the proper manner.

The weight of the pipe system, particularly in buildings of great height, is of importance. It should be borne in mind that a 6-inch pipe filled with water weighs approximately 20½ pounds per foot and

an 8-inch pipe filled with water approximately 31 pounds per foot. These figures should not be overlooked in planning, as the question of proper support and footings is a vital one.

Having established the layout for the building under consideration, as to risers and feed mains, the location of cross mains and branch lines must be determined, as well as the spacing and location of sprinkler heads.

Before locating and spacing the sprinkler heads with a view of determining the capacity of water supplies, there is one thing of great importance that must be taken into consideration, and that is that the sprinkler heads are located on the top of the pipe, in an upright position, except in the case of concealed pipe systems, where the sprinkler heads are located in a pendant position, a subject which will be dealt with later on. The deflector of the head must be not less than 3 inches or more than 10 inches below the ceiling or bottom of a joist, and in addition to this the head itself as set up measures approximately 2½ inches in height, to which must be added the diameter of the pipe fittings, so that the pipe system will be from 8 to 15 inches below the ceiling, according to the form of construction. This space allowance should be considered in planning for the equipment of a building with sprinklers, and the rule requiring that no goods or materials should be stored or piled within 2 feet of the ceiling or the bottom of the joists should be kept in mind. This last rule is necessary in order that the water from the sprinklers may be properly sprayed over the surface to which the sprinkler head is figured to give protection.

For buildings of ordinary construction—that is, with open joists—the sprinkler heads will approximately cover 72 to 80 square feet per head, but in no case should the heads be over 8 feet apart across joists, and 10 feet with joists (see Figure 1) and they should always be staggered. Under slow-burning construction, a spacing of approximately 90 to 100 square feet per head can be figured, although in certain types of paneled ceilings the heads will approximate less area in square feet in order not to have the distribution of water obstructed by the girders or beams forming the panel.

In the form of ceiling construction the depth of the beams plays an important part in determining the number of sprinkler heads necessary. If the beams average 10 inches in depth and are spaced 4 to 5 feet apart in 20-foot bays, two lines of sprinklers at right angles to the bay, with the sprinkler heads staggered in the centre of the bay with deflectors 10 to 12 inches below the ceiling, will

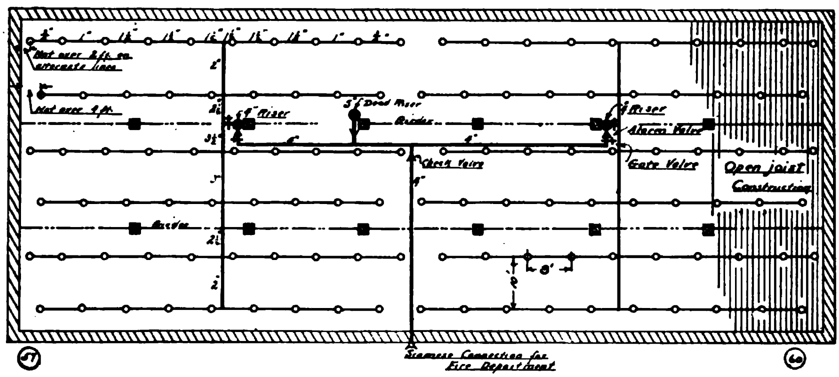


FIGURE 1. PLAN SHOWING FEED MAINS IN BASEMENT AND SPACING OF SPRINKLERS UNDER OPEN JOIST CEILING.

make a desirable layout which will give good protection. Further, this layout will keep the piping up close to the bottoms of the beams, thereby avoiding numerous fittings, and at the same time giving ample head room. In buildings of mill construction, the heads should be spaced as shown in Figure 2.

Fig. 3 shows the best method of spacing sprinkler heads under ceilings of fireproof construction where the beams forming the panels are not more than 8 inches in depth, spaced 6 feet apart, and the girders not over 16 inches in depth spaced 20 feet apart.

Fig. 4 shows the best method of spacing sprinkler heads under fireproof ceilings where beams are not over 12 inches in depth, spaced from 4 feet to 5 feet 6 inches apart, with girders not over 24 inches deep, spaced 20 feet apart. Either of the above methods will admit of the proper distribution of water over the contents provided the deflectors are not less than 3 inches below the soffit of the beams and not more than 15 inches below the plane of the ceiling. Either of the above methods may be used under semi-mill construction ceilings.

The important point to consider is to have not more than 100 square feet of ceiling surface allotted to a sprinkler

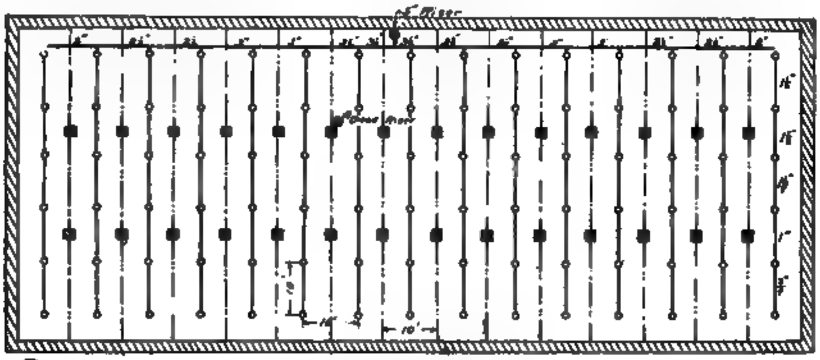


FIGURE 2. SPACING OF SPRINKLER HEADS UNDER MILL CONSTRUCTION CEILING. (SPRINKLERS SPACED 10 FEET APART ON A LINE IN 10-FOOT BAYS.)

THE CEILING IN ONE OF THE OPEN STORIES AT GIMBEL BROTHERS' STORE, SHOWING THE DISPOSITION OF THE SPRINKLER HEADS.

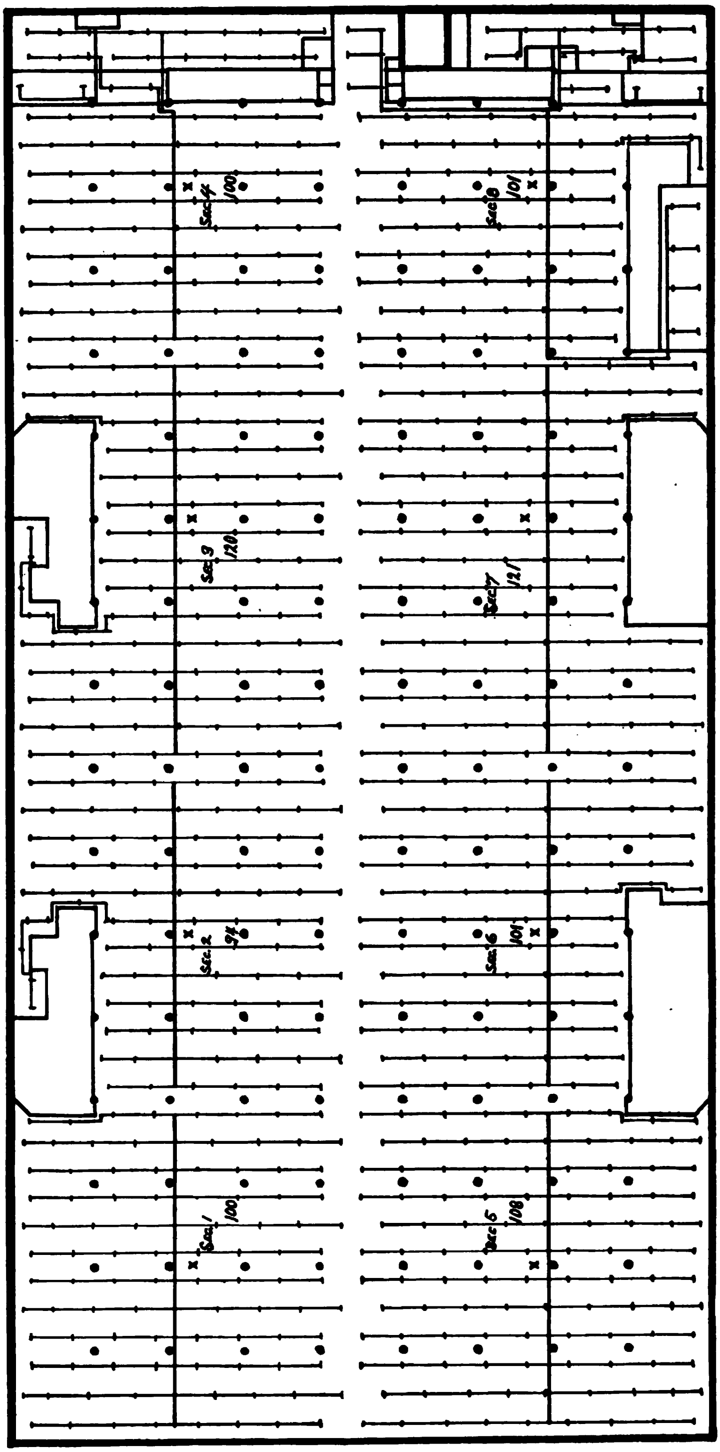


FIGURE 5.—THE RISERS WHICH FEED EACH SECTION ARE INDICATED AT X IN THE PLAN.

and the heads so located as to be not more than 12 feet in radius from each other.

Fig. 5 shows an ideal method of spacing sprinkler heads under ceilings of fireproof construction where the girders forming the bays are of unusual depth and where the pipe system is concealed.

(*To be continued.*)

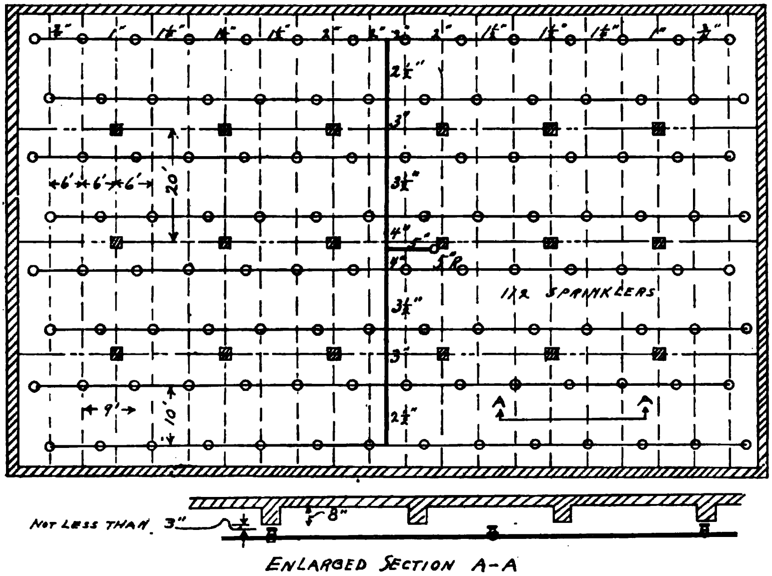


FIGURE 3.—SKETCH SHOWING METHOD OF SPACING SPRINKLER HEADS UNDER FIREPROOF CEILING (BEAM CEILING) WHEN BEAMS ARE NOT OVER 8 INCHES DEEP.

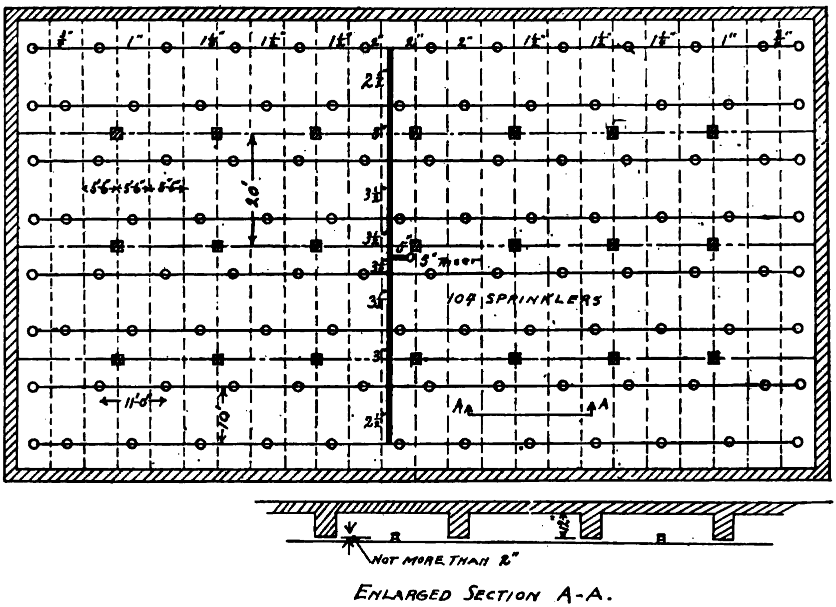


FIGURE 4.—SKETCH SHOWING METHOD OF SPACING SPRINKLER HEADS UNDER FIREPROOF CEILING. (BEAM CONSTRUCTION) WHERE BEAMS ARE NOT OVER 12 INCHES DEEP.

NEW BUILDING FOR THE MARYLAND CASUALTY CO., BALTIMORE, MD.

Elevators: Standard Plunger Elevator Co. Otto G. Simonson, Architect.
Enameled Brick: American Enameled Brick & Tile Co.
Clocks. Seth Thomas Clock Co.
Star Expansion Bolts Used.
Terra-Cotta. Conkling-Armstrong Terra Cotta Co.

ARCHITECTURAL DESIGN

Architectural Department, Harvard University

THE instruction in Architectural Design in the School of Architecture of Harvard University, following the introductory course on the orders and the elements of architectural form, is divided into three successive courses, which may be designated as elementary, intermediate, and advanced. A student is promoted from one course to the next according to his proficiency as shown in the problems and sketches in design which he executes. Advancement is therefore reckoned not by years of work, but by attainment.

The loggia by Mr. W. E. Rowland is an example of the sketch problem in advanced design. The problem was a Ceremonial Loggia on a State Capitol building, in which the Governor might stand on occasions of public functions, especially for the purpose of reviewing troops or other processions. It was supposed to occupy an angle pavilion. This drawing was awarded the prize (in 1911) offered annually by the Boston Society of Architects.

The next two drawings show another sketch problem in advanced design, the work of Mr. S. F. Kimball and Mr. Rhodes Robertson. The sketch followed the solution of a large problem of a great Roman Catholic Church, with parish schools, clergy house and nunnery. The sketch called for was a doorway of the problem previously rendered. The drawing of Mr. Kimball won the prize offered by the Boston Society of Architects in 1910.

The subjects for the problems in design are selected, especially in the intermediate and advanced courses, from such as are characteristic of American requirements, most of them being chosen from among current problems of frequent occurrence. The imagination of the students is stimulated by encouraging them to handle these problems in an ideal way—in such manner as they would be handled under the most favorable conditions. After the students have made their sketches *en loge*, thus fixing the scheme on which their solution of the problem must be worked out under the criticism of the instructors, they are taken to visit some of the best or most characteristic actual buildings of the type they are studying. The practical requirements of such buildings are then explained on the spot, and are brought home to them by an examination of the building itself as a working machine. They are then aided in making use of this knowledge in the working out of their design, thus learning how to give artistic expression to actual requirements, how to relate practical demands of arrangement or of construction to beauty of design. In this way, for instance, the modern department store, the religious association building and the fire engine house have lately been studied. This study is supplemented by lectures on the requirements of modern buildings by such well-known architects as Mr. R. S. Peabody, Mr. Frank Miles Day, and Mr. Cass Gilbert, all of them past presidents of the American Institute of Architects.

The advanced course in design is in the hands of Professor E. J. A. Duquesne, Grand Prix de Rome, Architect of the French Government, and until

A CEREMONIAL BALCONY FOR A STATE CAPITOL BUILDING.

Problem in Advanced Design.
School of Architecture, Harvard University.
Awarded Prize of Boston Society of Architects, 1910.

Designed by Wirt C. Rowland.

lately, patron of an atelier in Paris and member of the Jury of the Ecole des Beaux-Arts. Professor Duquesne has designed and carried out important buildings in France, and is now practicing in Boston.

Architectural history is taught by Professor H. Langford Warren, F. A. I. A. (of the firm of Warren & Smith), who is also chairman of the department.

The entire instruction in architecture is in the hands of practicing architects.

A PORTAL FOR A LARGE CHURCH.

Problem in Advanced Design. Designed by Sidney F. Kimball.
School of Architecture, Harvard University.
Awarded Prize of Boston Society of Architects, 1910.

A PORTAL FOR A LARGE CHURCH.

Problem in Advanced Design. Designed by Rhodes Robertson.
School of Architecture, Harvard University.

SWISS CHALET DESIGN

By WM. S. B. DANA, B. S.

VI.

"You will be surprised if I tell you that the chalets of the Swiss mountains are exactly the same as the chalets that one sees on the slopes of the Himalayas, and in the valleys of Kashmir."
Viollet le Duc.

IT was my pleasure on a dazzling Genevan summer's day, to visit the handsome châlet of a certain universally esteemed *pasteur* of Geneva. The impression that I received was that of a palace of wood—rich, warm, red wood. The floors were of parquetry, the walls of long, narrow, vertical panels, and the ceiling, beamed. The châlet, as I approached it, appeared as in the accompanying cut, all the shutters closed to keep out the intense sunlight. I presented myself at the porch door under the awning and was requested to enter at the main entrance a little further to the left. I found a generous hall-way flanked on the right by a dining room, and on the left by a kitchen; next to this came the stairs. In the kitchen I noted the characteristic tiled floor of dull red squares placed diagonally, and the softly tinted porcelain lined range, a peculiar product of Swiss manufacture. To the rear were the reception rooms. Upstairs

THE RECEPTION ROOM

the arrangement corresponded to that below, with everywhere the finish of wooden panels and beamed ceilings. A view of the reception room is given.

Geneva is a famous home of châlet manufacture and design. From its *fabriques,* châlets of all manner of shapes and sizes are sent forth into the world to become summer houses, mountain railroad stations, dwellings, hotels, etc. Probably the most important manufacturers are Ody and Company, and Spring Frères. To quote from "Publications Internationales": "the firm of Ody has a special reputation for the elegance and solidity of its châlets. They

CHALET OF PASTEUR—GENEVA
Product of Bernese Fabrik.

CHALET BIENSIS ON THE HEIGHTS OVERLOOKING LAKE GENEVA AT MONTREUX.

have constructed a quantity of châlets in the canton (of Geneva) as well as in Switzerland, also in France, America, etc."

In the "Revue Universelle" we find, among others, these words concerning the reputation of Spring Frères: "We have . . . a list of references—among whom we find the names of doctors, engineers, lawyers, manufacturers, who are especially competent to judge the châlet from the standpoint of strength as well as from that of health and comfort."

From the article on Ody and Company, some valuable information is to be gleaned; we quote: "First, and before all, they tell us, in order to construct a good châlet, good wood is necessary. But Switzerland is a privileged country, as a producer of the best timber, and our firm possesses a tremendous stock of it in reserve; it is well seasoned, having been stored for seven or eight years.

"It goes without saying that, independently of the quality of the wood, a careful handling and treatment, learned only by long experience are necessary. . . . Wood which is not sufficiently dry has a tendency to be influenced by the temperature, resulting in structural defects. A good châlet ought to last for a very long time, as witness the century-old châlets called 'mazots.'

"All beams for the châlets are grooved their whole length, and dowelled together at least once in every yard. On the interior of each exterior wall is a lining of brick with a shallow air-space between, which insures the best of insulation from extremes of temperature.

"The outside walls are coated with a mixture of Norway tar and hot oil, which preserves the wood indefinitely.

"The cost of châlets is about $400 a room for a good châlet. The châlets, besides their beauty, require no repairing, as the great overhanging gables serve not only as decorative features, but as a protection from the weather.'

CHALET BIENSIS, MONTREUX.

From the "Revue Universelle," under the title "The manufacture of Swiss châlets, Spring Frères, Geneva": "The châlet is the Swiss dwelling *par excellence,* the typical construction, just as the brick house is the dwelling of the English; more than this, the châlet is the construction economic. Châlets range in size from two rooms to twenty. They can be made to suit all tastes, and to accommodate all purses. They are solid, comfortable, habitable throughout the year. They require no more attention than the ordinary house and can be made incombustible by a special preparation. Built on footings of concrete and foundations of masonry, they are impervious to dampness. Constructed of heavy beams, they are reinforced on the inside by a thin brick wall, or by paneling. Spring Frères have also begun the manufacture of châlets with triple shell walls, which can be handled at slight expense. A châlet like this latter, built on a masonry foundation is, on account of the air-spaces between the various shells, guaranteed to preserve an even temperature, equivalent to that obtained by masonry walls 21 inches thick.

"For countries exposed to severe cold or tropical heat we cannot too highly recommend this system of construction. In fact, with the same wall structure, the number of shells and spaces between can be increased, producing as a result insulation equivalent to that obtained by a masonry wall more than 3 feet thick.

"The advantage of this type of châlet is its rapidity of construction; in one month's time after the foundation is laid, it is possible to prepare a châlet of fifteen rooms in the workshop and erect it at any point. The rapidity of manufacture, and consequently the reduced cost of erection, as well as of transportation, because of reduced weight, insure a great

1. Railroad Station, Montbovon.
2. A chalet doorway, Chateau d'Oex.
3. Corner of chalet, Berne.
4. An aged chalet, Chateau d'Oex.
5. A modern chalet, Chateau d'Oex.
6. A Bernese chalet, with exterior alcoves, flower balconies and awnings.

CHALET FULPIUS AT GRAND LANCY.
Ody & Co., Manufacturers.

economy, while maintaining the same conveniences and appearance; for the châlet *à parois isolantes* (isolated walls) yields nothing to other types in the matter of æsthetics, solidity and durability.

"The wood used is pine, pitch-pine, and oak. All parts of the building are arranged so as to prevent the collecting of water and dampness.

"The price of the châlet ranges from $600 to $12,000.

"In the high country are châlets of the 15th and 16th centuries which are still used as dwellings; this is sufficient proof of their powers of resistance and durability. The châlet is the constructon of greatest solidity; in the mountainous regions, where the severe climate and high winds would not allow of any but the most solid construction, the châlet is the favorite form of dwelling.

"The construction in wood cannot be too highly recommended in countries where earthquakes are frequent. Stone dwellings collapse at the slightest movement of the earth, or, at least, crack, while those of wood remain unaffected; the rapidity and facility of manufacture and erection of hollow walls (Spring Frères method) make them specially adapted to the colonies."

MAP OF GENEVA.

The *fabriques* of Ody and Company and Spring Frères are indicated on the portion of the map of Geneva which is given; "A" is the location on the hill-top of Ody and Company, and "B" that of Spring Frères; the location of the United States Consulate is indicated by letter "C."

A night ride by train along the north-

DETAILS: BRIENZ, KIENHOLZ—FROM VARIN.

ern shore of Lake Geneva, past the enchanting home of Paderewski, at Morges, to Lausanne, where I spent the night; then a Sunday morning boat ride across green waters brought me to the favorite winter resort at the head of Lake Geneva, Montreux. On the almost perpendicular mountain side above Montreux, I found Biensis, a model châlet designed for the Paris exposition of 1880, where it was bought by a prominent citizen of Montreux, dismounted and shipped to its present eyrie. An idea of its situation may be gained from the photograph: another cut shows it

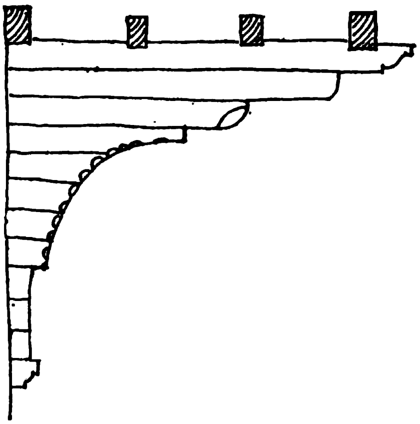


FIG. 32.

more in detail. A leading citizen of Montreux, whom I had been recommended to call upon, kindly gave me permission to examine some new châlets which he was building. The panorama from their balconies, under the broad sweep of their vast gables was matchless. With the aid of the foreman, who talked good-humoredly to me in Italian-French-Swiss, I learned the names of many details of these châlets which were still in

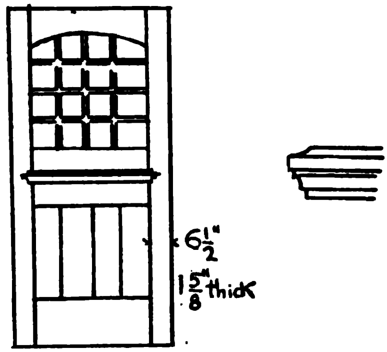


FIG. 33.

the unfinished wood. In all cases I found the walls to be made of a core of 3-inch planks, on edge. The floors were of cinder concrete with steel beams, the beams being 28 inches on centers, with flanges 2¼ inches wide.

Fig. 32 shows a sketch of one of the great overhanging consoles (projection about 9 feet), which was most easily obtained by lying flat on my back on the balcony below it. Fig. 33 is an entrance door. On the way by the funicular railway from Montreux to Berne, among giant mountains, and through giant valleys, I took some snap-shots, as the railroad station at Montbovan, and several at Chateau d'Oex and Berne.

Upon the advice of the vice-consul at Berne, I visited the Parquet and Châlet fabrik at Interlaken, and obtained from them a set of plates with a prospectus of their work. I quote from this latter: "The different styles of the old Swiss blockhouse, whose rugged construction has resisted for centuries the elements, and whose picturesque outlines harmonize so well with the scenery, serve as a model for the construction and style of the châlets."

(*Concluded.*)

THE MECHANICS' BANK, NEW HAVEN, CONN

Bronze Entrance Doors: Wm. H. Jackson Co.
Fireproof Windows. The Day Co.
Electrical Contractors: Stevens & Wafer.

Leoni W. Robinson, Architect

The interesting building of the Mechanics' Bank in New Haven is a good representative of a type which has been constructed for some time in the large cities and is now being adopted for bank construction generally throughout the country. The bank is notable for its fine interior marble, bronze work, both exterior and interior, and for its fireproof construction.

The builders were the Sperry & Treat Co. The Day Company supplied the fireproof windows and Stevens and Wafer were the electrical contractors. The furniture of the officers' and directors' room was made by the Doten-Dunton Desk Company; De Francisci Brothers Company did the interior marble work and the John Polachek Bronze & Iron Co. did the interior metal work.

The Markle Bank and Trust Company building is notable in that it is one of the first examples outside of New York City in which wood has been entirely eliminated from construction. Wire-glass in metal sash is used in all windows exposed to outside fire risk, it being intended to make the building as nearly as possible conflagration-proof.

The building has ten upper stories devoted to offices and 75 per cent. of the total area of the building, measuring from the outside walls, is rentable space on all floors devoted to offices

The builder was James G. Doak & Co., and the bronze work was done by John Polachek Bronze and Iron Company

The building for the Newark Fire Insur-

(Continued on page 220.)

THE MECHANICS' BANK. ENTRANCE.
Bronze Entrance Doors: Wm H. Jackson Co. Leoni W Robinson, Architect.

MARKLE BANKING AND TRUST COMPANY, HAZELTON, PA.
First Story Plan (See Page 218.) John Irwin Bright, Architect.

THE MECHANICS' BANK. THE BANKING ROOM SIDE AISLES.

Leoni W. Robinson, Architect.

Bronze Screen and Ornaments: John Polachek Bronze & Iron Co.
Interior Marble. De Francisci Brothers Co.

[illegible]

Leoni W Robinson, Architect.

Bronze Screen and Ornaments: John Polachek Bronze & Iron Co.
Office Furniture: Doten-Dunton Desk Co.
Interior Marble: De Francisci Brothers Co.

THE PATERSON SAVINGS INSTITUTION, PATERSON, N. J.
Engineers and Contractors. Bankers' Building Bureau.

THE PATERSON SAVINGS INSTITUTION
Engineers and Contractors: Bankers' Building Bureau.
Chairs: The B. L. Marble Chair Co
Interior Marble: Voska, Foelsch & Sidlo, Inc.

MARKLE BANKING AND TRUST COMPANY, HAZELTON, PA.

Bronze: John Polachek Bronze & Iron Co. John Irwin Bright, Architect.

BUILDING FOR W. & J. SLOANE, 5TH AVENUE AND 47TH STREET, NEW YORK.

Corbin Hardware.
Otis Elevators.
Newman Watchclock System.
Evans' "Crescent" Expansion Bolts Used.
Star Expansion Bolts Used.
Rockwood Sprinkler Equipment.

John B. Snook & Sons, Architects.

NEWARK FIRE INSURANCE COMPANY, 41 CLINTON STREET, NEWARK, N. J.
Star Expansion Bolts Used. Ely & Ely, Architects.

(Continued from page 212)

ance Company is a single story structure with a mezzanine across the front over the entrance for offices.

The builder was E. M. Waldron Co.; the Anderson Lumber Company did the interior trim and cabinet work The Browe Company supplied the lighting fixtures.

The building at 80 Maiden Lane has a frontage on that street of 143 feet with a frontage on Cedar Street of 173 feet. The building is twenty-five stories high, the top or attic story being lighted by bull's-eye windows. The exterior walls are faced with cream-colored enameled brick with enameled surface terra-cotta trim

The Thompson-Starrett Company of New York were the builders The W G Cornell Company did the plumbing; the painting and decorating were done by the W. P. Nelson Company; William H. Jackson Company furnished mantels and the lighting fixtures were supplied by the Mitchell Vance Company; the rubber rugs in the vestibules were produced by the Essex Rubber Co.; P and F Corbin supplied the hardware; and Otis elevators were used.

NEWARK FIRE INSURANCE COMPANY. OFFICE WITHIN THE COUNTER.
MAIN FLOOR.

Lighting Fixtures: The Brow- Co. Ely & Ely, Architects.
Interior Trim and Cabinet Work: The Anderson Lumber Co.
Evans' "Crescent" Expansion Bolts Used.
Stanley Ball Bearing Hinges Used

MERCANTILE BUILDING, N. E. CORNER OF 7TH AVENUE AND 24TH STREET, NEW YORK.

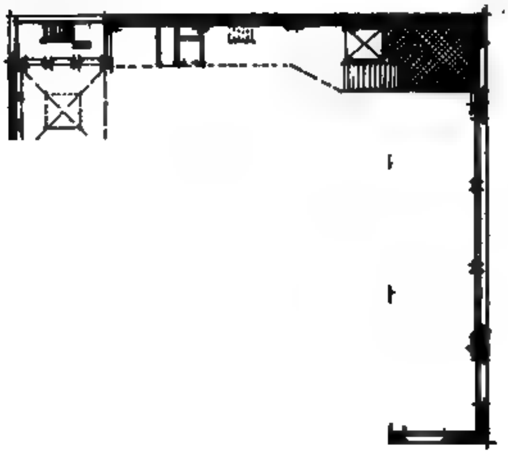
Builders, Theodore Starrett Company.
Tapestry Brick: Fiske & Company, Inc.
A. B. See Electric Elevators.
Lighting Fixtures: The Simes Co.

Frederick Squires, Architect.

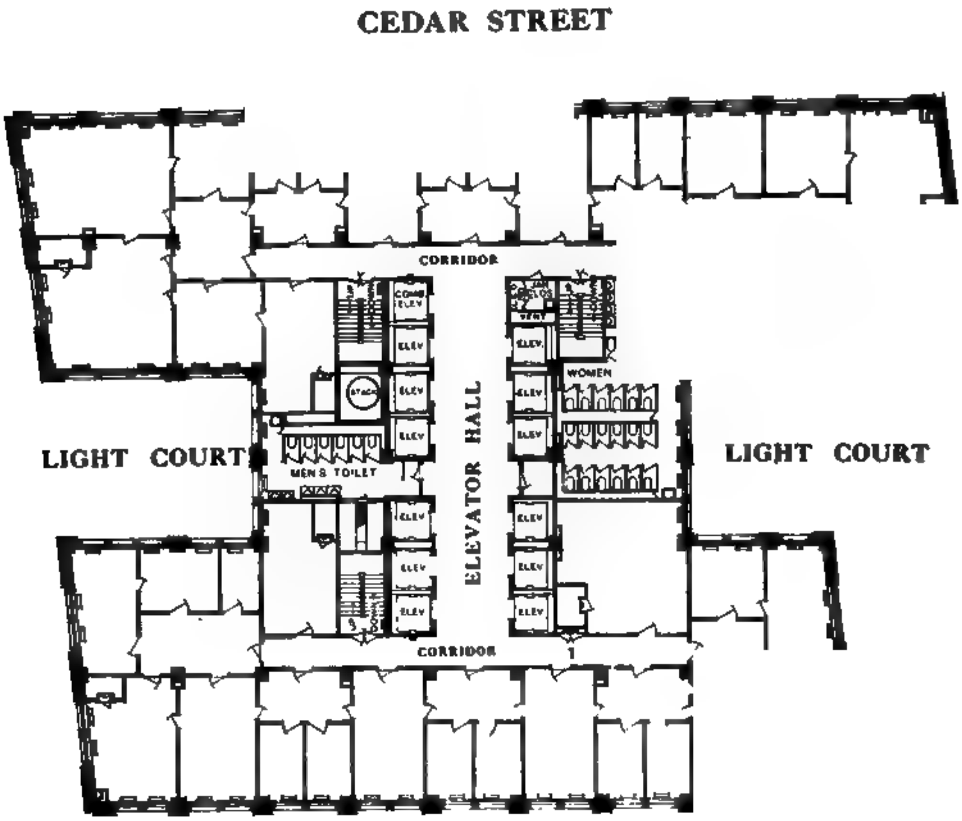
MERCANTILE BUILDING. DETAILS.

Builders: Theodore Starrett Company
Tapestry Brick: Fiske & Company, Inc.
Sidewalk Elevators. Burwak Elevator Co.

Frederick Squires, Architect.



MERCANTILE BUILDING. FIRST AND TYPICAL STORY PLANS.
Frederick Squires, Architect.



FIRE COMPANIES BUILDING. TYPICAL STORY PLANS.
D. H. Burnham & Co., Architects.

FIRE COMPANIES BUILDING, 80 MAIDEN LANE, NEW YORK.

Plumbing: W. G Cornell Company.

Mantels: Wm. H. Jackson Co.

Otis Elevators.

Corbin Hardware.

Newman Watchclock System.

D. H Burnham & Co., Architects.

Evans' "Crescent" Expansion Bolts Used.

A Look from Maiden Lane Shows the German American Building Overlapping.

From Pine Street the View Strains the Eye Even As It Does the Camera.

FIRE COMPANIES BUILDING, 78-88 MAIDEN LANE, 13-27 CEDAR STREET, NEW YORK.

FIRE COMPANIES BUILDING. THE ELEVATOR CORRIDOR. AN ELEVATOR SCREEN.

Lighting Fixtures: The Mitchell Vance Co. D. H. Burnham & Co., Architects.
Otis Elevators.
Star Expansion Bolts Used.

FIRE COMPANIES BUILDING THE VESTIBULE ON MAIDEN LANE.

D. H Burnham & Co., Architects.

Rubber Rugs: Essex Rubber Co.
Painting and Decorating: W. P. Nelson Co.
Corbin Hardware.

Otis Elevator Company

Announce their Removal, on or about June 15, 1912 to their New Building Eleventh Avenue and Twenty-sixth Street New York

Otis Elevator Building

Which, through concentration of the General Offices and Metropolitan District Departments under one roof, provides for the benefit of the users of Otis Elevator Products, the most complete *"Supply" and "Service" Organization of any Elevator Company in the World.*

The achievement of this Company in perfecting the highest type of Elevators has gained for our product recognition as the standard of excellence throughout the civilized world,— and while the ***best built*** and ***least in need of "service" and repairs,*** users of Otis products are, through this concentration and enlargement of facilities, ***protected by a "Service" Organization as perfect as the product itself.***

In addition to housing all the General Offices of the Company there will be kept on hand at all times ***a full line of all parts and supplies ready for immediate delivery.*** Our "Service" Organization will include factory-trained experts thoroughly familiar with Elevator construction, who, with our ***Automobile Service*** for expediting the delivery of needed parts, will be on call ***at all times,***—Days, Nights, Sundays and Holidays.

(New) **Telephone 7500 Chelsea**

Private Branch Exchange Connecting All Departments

We build and erect all types of Passenger and Freight Elevators,—for all kinds of power;—including Otis "Traction" and "Drum" type Passenger and Freight Elevators;—Otis Inclined and Horizontal Freight Elevators,—Otis Escalators or Moving Stairways, and Moving Sidewalks,—and Otis Automatic Push-Button Elevators for private residences.

BOOK REVIEWS

ROMANESQUE ARCHITECTURE IN FRANCE. Edited and with an introduction by Julius Baum. New York: E. P. Dutton and Company. Price, $7.50 net.

This volume, which is a companion to "Baroque Architectue" is the same size and is equally perfect in its method of reproduction. There are 226 plates. The method of presentation is the same, the text consisting of an historical resumè which the author, Dr. Baum, has illustrated with a number of plans and sections of churches. In the main the illustrations show a larger proportion of church work than is exhibited in the book on "Baroque Architecture."

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CONCRETE COSTS. By Frederick W. Taylor, M. E., Sc. D., and Sanford E. Thompson, S. B. New York: John Wiley and Sons. Price, $5.00 net.

This new book by the authors of "A Treatise on Concrete, Plain and Reinforced," which is very favorably known by engineers and architects, consists of tables, and recommendations for estimating time and cost of labor operations in concrete construction and for introducing economical methods of management. The chapters include the following: approximate costs of miscellaneous concrete work; approximate cost data on concrete structures; approximate costs of reinforced concrete buildings; determination of labor cost; task-work in construction; proportioning concrete; tables of quantities of materials for concrete and mortar; cost of concrete materials; excavating and crushing stone for concrete; handling and transporting materials; labor of hand mixing; machinery plants for mixing and handling concrete; labor costs of machine mixing; forms for mass concrete; arch centers; forms for reinforced concrete; tables of concrete volumes; tables of steel areas and quantities; tables of times and costs bending and placing steel; tables for designing forms; tables of quantities of lumber for forms; tables of times and costs of labor on forms; estimates for reinforced concrete construction.

The text includes 81 figures which are necessary to the better understanding of the subject. They deal mainly with form construction and cement handling and concrete mixing machinery. The book should be of great aid to architects and engineers in enabling them to make accurate estimates of the cost of concrete and the cost of erection of concrete structures. It is a work that will be of service to contractors and superintendents also, enabling them to plan and lay out their materials and methods of construction so that the greatest economy may be obtained in handling and in erection work. In a broad sense the work is of value as introducing scientific management into building construction. A distinctive feature of the book is its tabulated information as to the time necessary for a workman to perform a certain task. This information should enable a superintendent or foreman to greatly increase the efficiency of the laborers and mechanics under him. As outlined in the introduction, it is pointed out that analysis, synthesis and proof are the three sections of writing a book, and if we may judge from the character of the text and the information presented, the entire work represents the careful thought of well-ordered and regulated minds.

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BAROQUE ARCHITECTURE AND SCULPTURE IN ITALY. By Corrado Ricci. New York: E. P. Dutton and Company. Price, $7.50 net.

This book, outside of a few introductory remarks, consists of 274 plates about 9 inches by 12 inches in size. The illustration and reproduction are of the most perfect character, and the photographs have been carefully chosen and most excellently made, making the reproductions by the half-tone process of the clearest possible sort. Baroque art persisted in Italy perhaps longer than elsewhere, and began to decline only towards the end of the 18th century. In France, Baroque art flourished in the reign of Louis XIV, and Rococo was the favorite in the reign of Louis XV. In the introductory pages the author gives an historical resumè of the style.

HAND-FORGING AND WROUGHT-IRON ORNAMENTAL WORK. By Thomas F. Googerty. The Popular Mechanics Company, Publishers, Chicago. Price, $1.00, postpaid.

The purpose of this book is to outline the methods of design and construction for wrought-iron ornamental work. It is directed to the use of instructors in manual training, students, amateurs, and professional workers. It deals largely with the constructive principles of interior iron work. Throughout the book there are illustrations of diagrammatical character, 122 in number. While the book is interesting reading, the practical phase of the question cannot but arise in the mind of anyone looking it over; while it looks very fascinating for the amateur on the face of it, in reality it presents many problems which require manual dexterity and knowledge of materials and use of tools which are only attained by long practice. High grade wrought-iron work is the product of the skilled workman who is also, in most cases, an artist. Not nevertheless that the book is misleading in that in a seemingly easy presentation, a difficult subject is concealed. To the practical ornamental iron worker or apprentice at that trade, the book should be valuable, but we wishing to discourage the amateur, we feel cannot recommend it to the amateur worker.

Art and Architecture

THE CITY HALL PARK SITE AND THE POST OFFICE.

We think it safe to say that any New Yorker who has any civic pride, or we may go farther and include any American who boasts of the architecture of his country and its structural achievements in building, who has the slightest eye for civic improvement would welocme the demolition of the Mullet post office building and the restoration of City Hall Park to its pristine state.

As a matter of expansion, to accommodate the growth of the post office department and the increased requirements of the Federal Courts, the present site is inadequate unless thereon the government should see fit to erect a skyscraper. With the other buildings surrounding City Hall Park towering skyward, it would seem by far the better course to increase rather than further restrict the air space. The movement for the removal of the post office to a new site has the approval of the Merchants' Association of New York, various other civic organizations and the support of architects. The city press has not been backward, either.

The American Anti-Boycott Association has issued a bulletin on injunctions as a remedy against illegal strikes. It says:

"A strike to benefit the working conditions of the strikers is ordinarily legal, but there are many kinds of illegal strikes against which an injunction may properly issue and be made effective if properly applied.

"Of such a character are all sympathetic strikes and strikes to prevent the use of open shop materials, such as are particularly frequent in the building trades to enforce the purchase of materials made under strictly union conditions. For many years there has been grave doubt as to the best method of dealing with such strikes, and many people have questioned the efficacy of the injunction as a remedy. The familiar argument in and out of court has been that it is impossible to make men work against their will, and therefore impossible to avert strikes by injunction. This argument ignores the important element that a large percentage of union men are not sufficiently interested in the object of such strikes to take part in them upon their own initiative and will gladly remain at work if the union delegates are forbidden to interfere. Our experience with the Carpenter's Union during the past year has conclusively demonstrated that the injunction properly applied can successfully deal with such a situation, and not only prevent strikes, but will result in the men who are out on strike returning to work."

Following this it gives a number of instances of proof

FOREIGN COMMERCE OF THE UNITED STATE AT HIGH-RECORD FIGURES.

The foreign trade of the United States in the fiscal year, which ends with next month will show larger totals than in any earlier year. The ten months' figures covering the commerce down to the close of April, just compiled by the Bureau of Statistics, Department of Commerce and Labor, make it quite apparent that in both imports and exports the totals for the fiscal year 1912 will be the largest on record. Imports seem likely to approximate 1600 million dollars, exceeding by between 40 and 50 million dollars the high record import year 1910, when the total was 1,557 million dollars. Exports seem likely to approximate 2,200 million dollars, or about 150 million dollars more than those of the previous high record of 2,049 million made in the fiscal year 1911.

This growth in foreign commerce, while common to both imports and exports, is especially marked in the export trade. Imports have increased approximately 850 million dollars since 1896, while exports in the same time have increased about 1,300 million, the excess of exports over imports in the same period increasing from 103 million dollars in 1896 to about 600 million dollars in the current fiscal year.

Next to raw cotton, iron and steel manufactures are the largest exports.

The National Building Trades and Employers' Association as now organized, makes the following statement:

"The objects of this association are declared to be the promotion and protection of the general interests of the Building Trades of the United States. It is its purpose to secure and maintain the highest standard of efficiency, a more uniform system and harmonious relation with those connected with the Building Trades; whether they be engaged in the manufacture or sale of appliances, supplies, materials or in the intallation of appliances, the use of materials, or the erection of buildings, and securing a more equitable system of dealing between the architect, owner and member to the end that the interests of all parties concerned may be fully protected and the trade in consequence thereof elevated to a higher standard of proficiency and usefulness, and in order to fully accentuate this declaration, to guarantee to the organization affiliated with this national association the absolute right of home rule in the adjustment of all matters pertaining to labor or questions of a local nature which may arise or exist in their respective localities; this national association to hold itself in readiness at all times to assist in every way possible in times of trouble when called upon through the proper officers."

This is included in the plans of organization adopted by the National Convention at Washington, D. C., on February 27 and 28, 1912.

Dodge & Morrison announce the removal of their architectural offices to Nos. 133-137 Front Street, corner of Pine Street, New York City. In these new quarters they obtain increased space and better light.

Arthur L. Loveless, formerly of the firm of Wilson & Loveless, architects, announces the opening of an office for the practice of architecture at 427-9 Henry Building, Seattle, Wash.

Robert W. Gibson, architect, formerly of 103 Park Avenue, New York City, has removed his offices to 185 Madison Avenue (Cameron Building), corner of 34th Street.

The firm of Squires and Wendehack has been formed for the practice of architecture, with offices at 27 East 22d Street, New York City. The firm consists of Mr. Frederick Squires and Mr. Clinton C. Wendehack.

The United States Civil Service Commission announces an examination on June 12, 1912, for a laboratory assistant in engineering, and another on June 26 and 27 for an assistant to inspector of ordnance. Particulars may be obtained from the commission at Washington, D. C.

Mr. Oswald C. Hering and Mr. Douglas Fitch announce the removal of their offices to the southwest corner of Madison Avenue and 31st Street, at which location they will continue the practice of architecture.

"Tests of the Absorptive and Permeable Properties of Portland Cement Mortars and Concretes" is the title of the third of the technologic papers of the Bureau of Standards of the Department of Commerce and Labor. Together with it is included "Tests of Damp-proofing and Waterproofing Compounds and Materials." The authors are Rudolph J. Wig and P. H. Bates. This is a valuable document which continues the series which was started by the Technologic Branch of the United States Geological Survey at the structural materials testing laboratories, St. Louis, Mo., under the direction of Richard L. Humphrey. When this work was transferred to the Bureau of Standards, July 1st, 1910, the unpublished data was delivered to this Bureau.

The constituents of concrete vary in absorptive qualities, porosity, percentage of voids, and surface qualities. These constituents may combine in numerous ways which will vary with changes in consistency, in manner of placing, in the stroke of the tamper, or the pressure of the trowel.

The investigations reported in this paper are not exhaustive. They cover some previously uninvestigated phases of this important subject and are contributory to our present meager knowledge.

The investigations are reported in two parts. Part I comprises the results of a series of tests on 11 different mortars and 23 concretes to determine their permeability at various ages, for various consistencies and thickness of test piece, and the absorption on 12 mortars at various ages and for various consistencies. Part II contains the results of a series of comparative tests of 40 compounds and several void-filling materials recommended for use or advertised as "damp-proofing" or "waterproofing" mediums, purchased privately in the open market.

The report, with its many statistical tables and illustrations, is one that should be of value to engineers and architects who are making a study of foundation work in buildings, and the results obtained should prove profitable information to them.

Fireproofing and Fire-Protection

MR. G. H. STEWART

NATIONAL FIRE-PROTECTION ASSOCIATION 16TH ANNUAL MEETING.

In the auditorium of the Insurance Exchange. Jackson Boulevard, Chicago, on Tuesday, Wednesday and Thursday, May 14, 15 and 16, the sixteenth annual meeting of the National Fire-Protection Association was held.

The program for Tuesday commenced with the morning session at 10 A. M., and after the regular business was concluded, the committee reports were considered The afternoon session opened at 2 P. M., with messages from the Hon. William H. Taft, President of the United States, Hon. Charles S. Deneen, Governor of Illinois, and Hon. Carter H. Harrison, Mayor of Chicago, which were followed by an address by Mr. E. P. Heaton. of Toronto, Ontario, the subject of which was "A Call from Macedonia," and another paper by Mr. Charles H. Fox of Cincinnati on the "Calibre of Fire Streams"

The committees reporting Tuesday were those on state fire-prevention associations, George R. Crossly, Chairman; private fire departments and fire drills, J. Albert Robinson, Chairman; forest, brush and grass fires, E. L. Sanders, Chairman; mine fires, H. M. Wilson, Chairman; high pressure fire service systems, H. B. Machen, Chairman; and standard hose couplings and hydrant fittings for public fire service, F. M. Griswold, Chairman.

The paper presented by Mayor Harrison of Chicago was very interesting and held the attention of the gathering. The report on standard hose couplings and hydrant fittings for public fire service was also a valuable and interesting document from the standpoint of the architect and builder. Mr. Robinson's report on private fire departments and fire drills produced a long discussion. The report was printed and presented at the meeting. It was systematized and covered all phases of the subject. To the factory owner. or any large employer of labor, the document is valuable.

THE SECOND SESSION

The program for Wednesday, May 15, was devoted exclusively to committee reports and there was a very large attendance, both of members and visitors. The following committees reported:

Cold storage warehouses, E. P. Boone, Chairman; automobile garages, F. E. Cabot, Chair-

(*Continued on page* 26)

man; electric railway, light and power properties, C. H. Patton, Chairman; fire prevention ordinances, W. E. Mallalieu, Chairman; standards, W. C. Robinson, Chairman; automatic sprinklers, E. P. Boone, Chairman; fire pumps, H. O. Lacount, Chairman; private fire supplies from public mains, E. V. French, Chairman; fire hose, W. C. Robinson, Chairman; and hydrants and valves, H. O. Lacount, Chairman.

The reports on cold storage warehouses, automobile garages, automatic sprinklers, fire pumps and fire hose, were of particular interest from the building standpoint. The report of the committee on standards was also valuable. A great deal of interest was taken in the series of fire prevention ordinances which were proposed, including a fire marshal law, regulations for matches, explosives and inflammable liquids. Strenuous opposition was raised by the paint, oil and varnish people to some of their provisions, and the entire report was finally referred to the executive committee with power to act.

The following resolutions were adopted:

1. The continued encouragement of fire resistive building construction, and the adoption of suitable building codes by all cities and towns.
2. The rigorous State and municipal regulation of the transportation and storage of all inflammable oils and explosives and the investigation of all fires by public officials.
3. The especial safeguarding of schools, theatres, factories and all other places in which numbers of people congregate or are employed.
4. The adoption of the automatic sprinkler system as a fire extinguishing agent in all commercial establishments and city blocks.
5. The universal adoption and use of the safety match.
6. A safe and intelligent celebration of Independence Day
7. Special education of children and their parents in habits of care regarding fire.

THE THIRD SESSION

The program for Thursday, May 16, concluded the committee reports, which were as follows:

Fireproof construction, including concrete and reinforced concrete, Ira H. Woolson, Chairman; fire protection coverings for window and door openings, W .C. Robinson, Chairman; gravity tanks, Gorham Dana, Chairman; manufacturing risks and special hazards, Benjamin Richards, Chairman; electrical committee report, F. E. Cabot, Chairman; explosives and combustibles,

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Charles A. Hexamer, Chairman. The first two were particularly applicable to building construction and were closely followed by the architects and builders present.

At the close of the session the following officers were elected:

President, H. L. Phillips, Hartford.

Vice-President, G. M. Robertson, San Francisco.

Secretary and Treasurer, Franklin H. Wentworth, Boston.

Chairman of the Executive Committee, F. J. T. Stewart, New York.

Members of the Executive Committee, E. B. Hatch, Chicago; E. P. Heaton, Toronto; R. L. Humphrey, Philadelphia; C. H. Phinnel, Boston; and T. B. Sellers, Columbus.

Powell Evans of Philadelphia, representing the commercial organizations, advocated an important change in regard to legislation looking to the reduction of the fire waste. He said that the National Fire-Protection Association had done a great work, but had not begun to realize all its possibilities. If it would work through the trade and commercial organization in its membership and use their influence to get in desirable legislation it could accomplish a great deal more than was now possible.

The executive committee was instructed to consider the formation of a committee on publicity and legislation, more than half of the membership of which should be made up of active members of the National Fire-Protection Association, representing trade organizations.

VISIT TO THE UNDERWRITERS' LABORATORIES

On Thursday afternoon, part of the program was a visit to the Underwriters' Laboratories at

(*Continued on page* 30)

207 East Ohio Street, Chicago. The program of this visit included inspection of the departments of electricity, chemistry, laboratory service, automatic sprinklers, gases and oil, and protection department, with a complete examination of the entire plant. For the benefit of the members and guests who visited the laboratories, tests were made of a metal window glazed with wire-glass, and of a three-gallon chemical extinguisher. Both gave satisfactory performance. Considerable discussion was held by different parties, notably the fire chiefs, as to the value of various appliances, all commending highly the automatic sprinklers.

The laboratory buildings cover now nearly the whole site, with the new two-story addition. They are the most complete for work of this kind probably of any in the world and the managers have every reason to be proud of the growth and progress of the work.

N. F. P. A. MEMBERSHIP.

The growth in membership of the National Fire-Protection Association shows the progress of the national movement for the prevention of fire and the increased activity to further better building. The following table shows the increase from May 1, 1911, to May 1, 1912:

	1911	1912
Active	92	101
Associate	1,216	1,479
Subscribing	644	832
Honorary	3	....
	1,955	2,412

At the convention a membership curve was distributed which showed the growth from the time of the organization of the society in 1897, with the predicted future increase through the following year. The first twelve years of the association's life showed a slow but gradual growth. In 1909 the public educational campaign was begun and in the three following years the membership has doubled. There is unquestionably great value in publicity and with the increased popular effort, the association has grown two-fold and the results of its work have multiplied boundlessly.

ANOTHER TEST.

On the occasion of the convention a series of practical tests were conducted at the testing station of the National Fireproofing Company at 26th Street and Shields Avenue, Chicago. Architects, engineers and builders were invited. The tests were on the bearing qualities of walls of different construction—hollow tile, concrete, etc. One test of a Monarch hollow tile block wall 8 inches in thickness, 36 inches long and 12 feet high, built in accordance with the Chicago building code, was tested to failure at 257¼ tons. The results for the tests were satisfactory. We understand that detailed reports of these tests will be available.

THE FIRE DRILL AND EQUIPMENT.

AN INTERVIEW WITH MR. W. GERALD HAWES OF THE JOHN SIMMONS CO.

While we all know that the checking of a great fire devolves more or less upon the efficiency of the fire equipment, yet in many instances, assuming that the equipment is satisfactory, how many building employees are capable of handling this fire line at the first alarm?

While in almost every instance the supervision of the equipment is in the hands of engineer or superintendent, yet how many of these men will expend even a little of their time now and then to see if it is in proper working condition; whether there exist any defects caused by previous operation or from lack of use?

On the other hand, while the workings of this equipment are understood by engineer or superintendent, yet how many building employees are drilled to handle it efficiently at the critical moment?

In fact, to most of them, it is merely a thing to be looked at, or worse still, their idea of handling it is to grab the nozzle and run toward the fire zone, forgetting to turn on the valve, tangling the hose and causing the loss of valuable time at the beginning of the fire.

The leading fire authorities advocate as a remedy for this a systematic drill to be held at least once every month, together with explanations to the various building employees of the working of the apparatus This should do much to insure the proper handling of fire lines when a fire

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alarm is sounded. Not only this, but the owners of buildings should insist on their engineers or superintendents making a personal inspection of the fire equipment, irrespective of that maintained by the Board of Underwriters. Besides money and time losses, we must not forget that the all-important element of fire equipment is its purpose of safeguarding human life.

An idea is fast gaining ground of installing two fire lines in a building with outlets on each floor. By this is meant that at one end of the floor there is still maintained the 2½" hose line which is to be used mainly by the fire department when they enter the building or as an auxiliary by competent persons; as in most instances, to handle this line and obtain the best results, especially if under high pressure, it would have to be in the hands of two building employees. The other line is to consist of 1½" hose with nozzle, which is reduced through the agency of a 2½" outlet from the 4" standpipe. This outfit is so simple that at the slightest alarm anyone on the floor can run to this station, turn on the valve, take the nozzle and run toward the fire zone This seems a very fair solution of a hose equipment for a large building, which may be used by anyone before the arrival of the fire department or the drilled building employees.

It is also a great point to remember that no matter how well you are protected against fire, you should immediately turn in an alarm upon the slightest sign of fire. In a great many instances a conflagration is caused by the independence of building employees. This should never be countenanced and instructions should be given that no matter how small the blaze may be, an alarm should be immediately turned in. This in itself might save thousands of dollars and no end of trouble that is caused afterwards.

To obtain these good results universally, we must not only have the co-operation of factory and building owners, but we must also have their support from a moral standpoint. They should at no time consider fire equipment from a monetary standpoint, for the best is none too good when it comes to purchasing material of this sort.

It should also be more generally known that the Underwriters' and Insurance Exchange will gladly furnish any information gratis as to the specification and installation of fire equipment. In addition to this, information on this subject will be willingly given by Mr. Hawes

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"THE FUNCTION OF A FIREPROOF BUILDING IS TO PROTECT THE CONTENTS OF THAT BUILDING FROM LOSS."

"It is not enough that a building should be incombustible, nor even that its steel frame should be safely insulated, nor that the incombustible members or decorations should be of a nature not easily damaged by fire, desirable as all these things are; but the house should be so arranged that only a small portion of the inflammable contents can be damaged by fire or water at any one time, and also that the lives of the occupants of the house may be safe. For the accomplishment of this result, three things are absolutely necessary: 1st, The building should be divided into as small sections as possible. 2d, Appliances, preferably automatic sprinklers, should be provided for extinguishing small fires in contents. 3d. Means of quick escape should be provided for the occupants."

"The subject of fire escapes is being given a great deal of attention at present, and properly so, the very best and safest means of getting people out of burning buildings should be provided, but after all, that method of settling the problem is a good deal like avoiding an epidemic of diseases in a town by providing good railroad service in which to get away. That should be only a last resort, and the most serious thought should be given to means of curing the trouble at its root. In the case of fireproof buildings, as above stated, the thing to be borne in mind is, that the function of a fireproof building is to protect its contents from loss, which can be done only by dividing the house into as small sections, both vertically and horizontally, as its normal use will permit, then to provide adequate extinguishing devices and lastly safe means of escape."—Report of Committee on Fireproof Construction—including concrete and reinforced concrete. E. T. Cairns, Chairman. The fifteenth annual meeting of the National Fire Protection Association.

As an expression of purpose in a broad sense, this quotation from Mr. Cairns' paper last year represents the underlying thought of almost every one who is trying to reduce our national fire loss. To architects and architectural engineers, who as a class control by far the largest proportion of the money expended in building each year in the United States, the value of the efforts that are being put forth by the National Fire Protection Association and its influential membership, is so great that it cannot be ignored.

To the man who makes building his profession, knowledge of modern methods of fire prevention, both in materials and in fire-extinguishing apparatus, is so essential that neglect of the valuable data which is his for the asking means self-elimination from the field.

To the man who owns the property the value of such information is greatest, for in the end he is the man who pays the bills, the insurance premiums, and suffers the losses. He has reached a period of enlightenment, and he is demanding a better building for himself, realizing that economy does not always exist in minimum first cost

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AN ENTERPRISING SUGGESTION.

We all like cheerful ideas. They promote good fellowship, success, and good business. This thought seems to have been the underlying motive which induced the Newman Clock Company to issue a souvenir bill folder for distribution at the National Fire-Protection Association meeting just held. This little leather folder contained within a greenback program giving the events of the convention. So much for the make-up of the folder. We are more interested in the spirit of the gift. It is a hint to everyone to fill the folder up; a prediction of prosperity and success, provided you install a Newman watchman's clock system in your factory.

Newman watchman's clock safeguards the Underwriters' Laboratories in Chicago.

The Vitrolite Company which manufactures a white sanitary product for wainscoting and other structural use, have located their Eastern office in the Fifth Avenue Building, New York.

Industrial Progress

AN ESSAY ON ARCHITECTURE.

Bulletin No. 176 of the University of Texas contains an essay entitled "Academic Training in Architecture," which was written by Hugo Franz Kuehne, Adjunct Professor of Architecture in that university. The essay is an appeal for a wider knowledge of architecture among people in general. Following an introductory appeal, it treats under subheads of technique; composition and design; history; and construction and practice.

THE WHITNEY COMPANY.

The Whitney-Steen Co., engineers, contractors and builders, of 1 Liberty Street, have assumed the corporate title of the Whitney Company. Mr. A. R. Whitney, Jr., is President and Treasurer; Mr. T. Eckford Rhoades, Vice President, and Mr. Arthur J. Henchey is Secretary and a director.

ANNOUNCEMENT IN CONNECTION WITH A RECENT CONTRACT.

The Federal Terra Cotta Company has recently secured the contract for furnishing the Architectural Terra Cotta to be employed in the 30-story loft building now in course of erection by the owner, Edward West Browning. at 110 and 112 West 40th Street, from plans by Buchman & Fox, architects. This building is unique in many features, notably its unusual height on the comparatively small ground area, of approximately a fifty-foot front with a depth of one hundred feet.

White full glaze architectural terra cotta is to be used on all four fronts, which is a decided departure in this character of building operation.

Other prominent contracts in process of execution by the Federal Company are:

Emmet Building, 29th St. and Madison Ave., Barney & Colt, architects.

Eagle Building, 21st St. and Fourth Ave., Warren & Wetmore, architects.

Longacre Theatre, 48th St., Henry B. Herts, architect.

The Times Annex, West 43d St., Buchman & Fox, architects.

The Gilchrist Store, Boston, Bigelow & Wadsworth, Architects.

Carlton Hotel, Montreal, Warren & Wetmore, architects.

REMOVAL NOTICE.

The John Polachek Bronze & Iron Company, who are workers in architectural bronze and iron, making a specialty of bank interior construction, announce the removal of their offices and works from 144 Clay Street, Borough of Brooklyn, to 480-94 Hancock Street, and 577-91 Boulevard, Long Island City. The necessity for the enlargement of their plant caused the change.

BUILDING TRADES ASSOCIATION OFFICERS.

The annual election of officers of the Building Trades Employers' Association was held in the rooms, 30 West Thirty-third Street, last week. C. G. Norman, the retiring Chairman of the Board of Governors, was presented with a gold watch and fob.

These officers were elected: President, William Crawford; Firse Vice President, F. G. Weber; Second Vice President, Edwin Outwater, and Treasurer, A. N. Chambers. William J. Holmes continues as Secretary. Charles J. Kelly was chosen to succeed Mr. Norman as Chairman of the Board of Governors.

ANNUAL MEETING OF THE JOSEPH DIXON CRUCIBLE COMPANY.

At the annual meeting of the stockholders of the Joseph Dixon Crucible Company, held at the company's main office in eJrsey City, N. J., Monday, April 15, the retiring board of directors, consisting of Geo. T. Smith,, William Murray, Edward L. Young, William H. Corbin, Geo. E.

(Continued on page 38)

Residence W. C. Sanderson, South Orange, N. J.

Long, William G. Bumsted and Harry Dailey were unanimoulsy re-elected.

Officers elected for the ensuing year are as follows: President, Geo. T. Smith; vice-president, W. H. Corbin; treasurer, Geo. E. Long; secretary, Harry Dailey, assistant treasurer and assistant secretary, J. H. Schermerhorn.

There were voted 9,304 shares of a total of 10,000. A number of stockholders attended the meeting and expressed themselves as well pleased with the Company's showing and with future prospects.

THE GORTON WROUGHT STEEL BOILERS

The Gorton wrought steel boilers are upright, tubular boilers built on the lines of power boilers, thus securing the greatest strength, durability and highest efficiency. The boiler shell is especially designed to secure the largest amount of efficient heating surface, which is about one-third more per square foot of grate than that of any other boiler. The tubes are spaced so as to give the free and rapid circulation of water necessary to properly absorb the heat. As the boiler shell is directly over the fire, it receives the benefit of all of the heat generated from the coal, which gives highest fuel economy.

Another feature of the Gorton wrought steel boiler is the self-feeding coal reservoir. This performs the duty of an experienced fireman in supplying coal to the fire, keeping a bright, sharp fire over the entire surface of the grate, and furnishing a constant supply of heat for twelve hours without attention in the coldest weather.

The new line of Gorton wrought steel boilers are made up in thirty-four sizes for steam, ranging in capacity from 390 up to 6,000 square feet; they are also made in thirty-four sizes for hot water, ranging in capacity from 600 up to 9,800 square feet.

These facts and other information covering Gorton wrought steel boilers are set forth in detail in the ne wcatalog, "Modern House Heating," which will be mailed free on application to the manufacturers, the Gorton & Lidgerwood Co., 96 Liberty Street, New York.

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Alphabetical List of Advertisers

Classified Advertisements

NOTE.—Every classified advertiser is entitled to insertion under one heading. Under extra headings, $5.00 a year each

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Polachek Bronze & Iron Co., John, 480-494 Hancock St. and 577-591 Boulevard, Long Island City.

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Gorton & Lidgerwood Co., 96 Liberty St., New York

BOLTS—Expansion, Machine Expansion, Sebco Mooring, Sebco Twin, Toggle.
Evans, F. H...31-35 Hewes St., Brooklyn, N. Y.
Star Expansion Bolt Co., 147-149 Cedar St., N. Y.

BRICK—Enameled Front. Hollow.
American Enamel Brick & Tile Co., 1184 Broadway, N. Y.
Carter, Black & Ayers.....1182 Broadway, N. Y.
Fiske & Co., Inc...Arena Building, New York
Harbison-Walker Refractories Co., 30 Church St., New York

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Van Dorn Iron Works Co........Cleveland, O.

BRONZE.
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Polachek Bronze and Iron Co., John, 480-494 Hancock St. and 577-591 Boulevard, Long Island City.

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Starrett Company, Theodore, 103 Park Ave., N. Y.

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Non-Staining Cement Co., 156 5th Ave., New York.

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Newman Clock Co., The...178 Fulton St., N. Y.
Prentiss Clock Improvement Co., Dept. 11, 92 Chambers St., N. Y.

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Speidel, J. G.....................Reading, Pa.
Standard Plunger Elevator Co., 115 Broadway, New York

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Holmes, Frederick S, 2 Rector St., New York.
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Evans, F. H...31-35 Hewes St., Brooklyn, N. Y.
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KEYSTONA
FLAT FINISH

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New England Granite Works, The, Westerly, R. I.

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Lane Bros. Co.............Poughkeepsie, N. Y.

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Chicago Spring Butt Co., Chicago, Ill.; New York
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Stanley Works, The, Dept. B.
New Britain, Conn., and 79 Chambers St., N. Y.

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Boyd Equipment Co...373 Fourth Ave., N. Y.
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KEYSTONA
FLAT FINISH

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Cork & Zicha Marble Co.,
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Essex Rubber Co.,
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Knoburn Company,
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SIDEWALK LIGHTS.
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Bommer Bros....257 Classon Ave., Bklyn, N. Y.
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Providence, R. I.
Rockwood Sprinkler Co...123 William St., N. Y.

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Van Dorn Iron Works Co..........Cleveland, O.

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Lane Bros. Co............Poughkeepsie, N. Y.

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Northwestern Terra Cotta Co.,
1000 Clybourn Ave., Chicago.

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Berger Mfg. Co.....................Canton, O.
Brooklyn Vault Light Co.
262 Monitor St., Brooklyn, N. Y.

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VENTILATORS.
Globe Ventilator Co................Troy, N. Y.
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WATER FILTERS.
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Washburne & Co., E. G.,
209 Fulton St., N. Y.

WOOD-WORKING MACHINERY.
Barnes Co., W. F. & John,
566 Ruby St., Rockford, Ill.

KEYSTONA
FLAT FINISH

"Painted and

Rooms of Bankers' Trust Co.

Trowbridge & Livingston Architects

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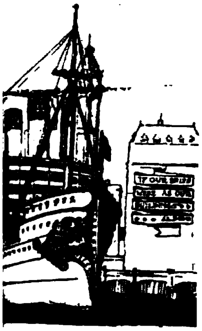
ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. JUNE, 1912 *NUMBER 6*

OUR FAIR ARCHITECTURE

BY J. L.



A GREAT many of our institutions in "these most brisk and giddy-paced times" may be said to be reckoning without the host. The host is the public, whose servants undertake to settle the score and receipt the bill without consulting their employer. Architecture is one of the things that would not be the worse for a little better acquaintance with its master—the public.

Architectural language is a strange jargon that the public does not understand. It almost makes one think of the Latin of the pill-makers, not intended to be understood by the consumers of the pills, or the French bill of fare which the majority of patrons have to get the waiters to translate. Writers on architectural subjects have been seeking ~~to gain the~~ applause of the architects rather than to explain to the general public. All of which has resulted in a popular misunderstanding and confusion, with no especial benefit to architecture itself,—rather, injury, because the average studious layman is confused when he talks about our architecture. He has a hazy idea that everything is wrong and in bad taste. He cannot see it himself, but the critics say it is bad, so it must be Things have come to this pass, that to praise is to show lack of culture.

I fear me professional jealousy has something to do with this bad reputation that American architecture has acquired. I, for one, am tired of hearing our fair archi~~tecture abu~~sed. It would be bad enough if the public were dissatisfied with it, but the vilifiers would seem to be the ones who live by architecture, and the art is "wounded in the house of its friends." Architectural criticism is anachronistic. The standards of the profession are the standards of the past, and our high-brow guides, philosophers and friends keep harking back to things and forms that are dead and gone.

Who is there that isn't familiar with the picture of high-pooped ships of the days of Hendrick Hudson? What if our ships were as our buildings? Call to mind one of these highly-decorated constructions, and then think what some of the big ocean liners of today would look ~~like if their~~ "outsides" were treated in the same "architectural" style. Imagine a group of architects—designers of high poops and carved figureheads—standing on the shore and shouting derisively as each flashily decorated ship went by, calling the figureheads laughable, the stack decoration a frenzy, the pilot house debased, and so on.

Well, that is an impossible picture, of course, in ship architecture, but not in building architecture. And how the blasé smatterer will sometimes work himself into a state of contempt for our beautiful (!) skyscrapers, those fine creations

that mark our country, which, in fact, name our country—the land of the sky-scraper—just as we speak of England as the land of roast beef, and France as the land of the frog.

Not long ago an American was returning to his native heath from a visit to a foreign strand. He was standing on the deck of the good ship as she came up the bay, drinking in with barbaric pride the sight of that mountain of buildings which his countrymen have builded on the lower end of Manhattan Island.

As the ship passed into the river and a nearer view was possible, the American, who knew most of the buildings, could not restrain his enthusiasm, and be broke into a description—a kind of seeing-New York lecture—for the benefit of a couple, Lord and Lady Somebody-or-other, who stood on the deck near him.

Now, his lordship was a good fellow, a noted clergyman—a missionary, somebody had said—and her ladyship was a good fellow, too. So they listened with rather unusual complacency to the returned patriot descanting on the beauties of—not nature exactly—well, let us say for the sake of argument the beauties of art, stretched out before him.

"That is the Singer Tower," said the returning native, pointing to the red and gray "monstrosity"—as he had heard it described on several occasions by intelligent American architects.

"Oh, yes, I've heard of it," said her ladyship. She was a sweet, kind woman and very much interested. "That is your tallest building, is it not?"

"No," said the American. "It was the tallest for a few weeks. The tallest is the Metropolitan Tower up there"—pointing into the distance. The Woolworth building wasn't started then.

"Why did they build the Singer Tower?" asked her ladyship. She did most of the talking, but her husband was a very attentive listener and occasionally put in a word.

The manner of the English couple was plainly indicative of their state of mind. The American felt that they were probably thinking of old Kaspar and Peterkin and little Wilhemine and the Battle of Blenheim. He could imagine that her ladyship was inwardly humming the refrain:

> "But what good came of it at last?"
> Quoth little Peterkin.
> "Why, that I cannot tell," said he,
> "But 'twas a famous victory."

The American thought of little Peterkin, but he plucked up courage. "Oh," he replied, "they thought it would make a good advertisement," and, after a pause, "maybe they thought it was beautiful, too."

Her ladyship had no comment to make on the astonishing statement that anybody could think that the Singer Tower beautiful.

"You should see the Singer Building at night," continued the American. "It really is wonderful. There's a kind of halo around it that makes it one of the sights of the world."

The ship had meantime been moving up stream, and the white tower of the Metropolitan Building was more easily discernible.

"There," said our American, "is our tallest building." His pride was self-evident.

An expression of sympathy came to the face of the kind lady who stood thus listening to the boyish—maybe the childish—raptures of the poor deluded barbarian. Undaunted, however, the American returned to the charge.

"The Metropolitan Tower is built of white marble," he said.

"Marble costs a lot of money," said his

lordship. "Why did they go to all that expense?"

The American thought again of Peterkin and the Battle of Blenheim.

"Ah, that I cannot tell," thought he, but he said, "Oh, they thought that was beautiful, too." And then, his courage, rising, he continued: "And it is beautiful. That white roof against the sky is a sight to stand and watch by the hour. Sometimes the top of the tower is lost in the mist."

Now, this feeling of these foreigners would not be worthy of notice were it not for the fact that it is typical. Many Americans have assumed a false attitude toward American construction and have affected a contempt for their own architecture. And the funny part of it is that American architects, and their satellites, the architectural critics, have started the talk.

Whoever would think of ridiculing England or Germany for their big ships? They have their great ships and we have our great buildings, and it is about time that the architectural knockers of America should be muzzled. There is hardly a thing in America that has been the object of more indiscriminate abuse than has our architecture.

The trouble is that our every-day American work is compared with the monumental specimens of European architecture. These architectural comparisons are most unfair. The critites have been comparing our commercial buildings with the palaces and museums of Europe.

On an automobile trip from the Riviera to Paris I was afforded an opportunity to observe some indigenous architecture, the "common people's" kind. We happened to run upon a "sub-division." There were the signs of the real estate boomer. Lots for sale, terms, and all the evidences of constructive activity. Here at last was a chance to see what the Frenchman was doing and compare it with the American's work. The houses were substantial, and undoubtedly were for the same class of people that we could find in some healthy American suburb. They were more permanently built than ours would be for the same class of occupany. The walls were of masonry, the roofs were tile. But one looked in vain for signs of "architecture." The houses seemed to have no single redeeming architectural feature. The walls were yellow stucco with red brick trimmings on the corners. They looked as though they have been designed by the village barber. If they were a fair sample of indigenous, modern French architecture, what is France coming to?

We Americans have listened to enough abuse of our architecture. Let us refuse to stand for it any longer. If they would tell you we are so bad, go over to the "other side" and see some of theirs. If you go, don't look at their dead architecture; look at their live architecture.

SUN PARLOR. OFFICES OF J. P MORGAN & CO., 31ST FLOOR OF THE BANKERS' TRUST CO. BUILDING.

LOOKING NORTH FROM THE 31ST STORY OF THE BANKERS' TRUST CO. BUILDING.

Granite: The New England Granite Works.
"Lafarge" Non-Staining Cement Used.

THE BANKERS TRUST COMPANY BUILDING, WALL AND NASSAU STREETS, NEW YORK.

Trowbridge & Livingston, Architects.

Builder: Marc Eidlitz & Son.
Granite: The New England Granite Works.
Hollow Metal Trim: Dahlstrom Metallic Door Co.
Basement Tile Flooring: Wm. H. Jackson Co.
Plumbing: W. G. Cornell Co.
Thermostats: Johnson Service Co.
Otis Elevators.

THE WALL AND NASSAU STREET CORNER.

Trowbridge & Livingston, Architects.

Granite: The New England Granite Works.
"La Farge" Non-Staining Cement Used.
Bank Vault Engineer: Frederick S. Holmes.
Bronze Rails: John Polachek Bronze and Iron Co.
Evans' Crescent Expansion Bolts Used.
Mantels: Wm. H. Jackson Co.
Loomis-Manning Filters.
Grant Overhead Pulleys Used.

THE BANKERS' TRUST CO. BUILDING

THE speed and perfection of the construction of the Bankers' Trust Company building was due to a well-ordered plan all thought out and scheduled in advance and performed with punctuality. The three parties entering into the contract for construction—the owner, the architect and the contractor—co-operated and worked together according to a definite scheme. The consulting engineer acted for the owners and held weekly meetings with the architects and contractor at which details of construction were agreed upon, charges passed and conferences held with the various subcontractors, superintendents and experts who were called in. The day previous to each of these weekly meetings, a similar meeting was held at the building by representatives of each party. A full

THE PUBLIC CORRIDOR. ENTERED FROM WALL STREET AND CONNECTING INTO THE HANOVER BANK BUILDING.

Trowbridge & Livingston, Architects.

Interior Marble: Batterson & Eisele.
Marble Floors Surfaced With International Floor Machines.
Lighting Fixtures: The Mitchell Vance Co.
Gleason-Tiebout "Camia" Glass in Lighting Fixtures.
Copper Covered Windows and Bronze Covered Doors. M. F. Westergren, Inc.
Otis Elevators.
Hose Racks (Yale) and Hose: W. D. Allen Mfg. Co.
Fire Bucket Tanks: The Safety Fire Extinguisher Co.
Insulated Wire: Habirshaw Wire Co.

THE FIRST STORY BANKING ROOM.

Trowbridge & Livingston, Architects.

Co.
ting Fixtures.
Co

STAIRCASE LEADING TO SECOND STORY BANKING ROOM.

Trowbridge & Livingston, Architects.

Lighting Fixtures: The Mitchell Vance Co.
Interior Marble: Batterson & Eisele.
Bronze Rails: John Polachek Bronze and Iron Co.

DETAILS IN THE SECOND STORY BANKING ROOM.

Trowbridge & Livingston, Architects.

Bronze Screens and Grilles: John Polachek Bronze and Iron Co.
Interior Marble: Batterson & Eisele.
Marble Floors Surfaced With International Floor Machines.

THE BANKING ROOM ON THE SECOND STORY.

Trowbridge & Livingston, Architects.

Interior Marble: Batterson & Eisele
Lighting Fixtures: The Mitchell Vance Co.
Bank Vault Engineer: Frederick S. Holmes.
Thermostats: Johnson Service Co.
Otis Elevators.

Gleason-Tiebout "Camia" Glass in Lighting Fixtures
Hollow Metal Trim: Dahlstrom Metallic Door Co.
Bronze Screens and Partitions, John Polachek Bronze and Iron Co.
Metropolitan Push Button Switches Used

THE IONIC COLUMNS OF THE SECOND STORY BANKING ROOM.

Interior Marble: Batterson & Eisele. Trowbridge & Livingston, Architects.
Hollow Metal Trim: Dahlstrom Metallic Door Co.

THE BANKING ROOM ON THE SECOND STORY.

Bank Vault Engineer, Frederick S. Holmes. Trowbridge & Livingston, Architects.
Interior Marble, Batterson & Eisele.
Bronze Screens and Grilles: John Polachek Bronze and Iron Co.
Copper Covered Windows and Bronze Covered Doors: M. F. Westergren, Inc.

written report of the progress of the building up to date was thus in the hands of those in authority at their weekly meetings. The building committee of the Bankers' Trust Company acted as a court of appeals for the actual constructors and did not otherwise concern itself with the details of the construction work except in the selection of artistic or architectural designs. The result of this plan, which has been here very briefly stated, was a wonderfully rapid accomplishment of a very difficult project.

Interesting articles on the construction of the Bankers' Trust Company building appeared in the "Engineering Record" for February 11, 1911, and April 29, 1911. These cover the general features and the construction of the floors and roofs with details of trusses.

The Bankers' Trust Company building was designed and erected under the supervision of Trowbridge and Livingston. Mr. W. E. S. Strong was the consulting engineer, and Mr. Thomas Bruce Boyd was the bank engineer collaborating with the architects. The builders were Marc Eidlitz and Son. The exterior is of granite, the material being supplied and cut by the New England Granite Works. La Farge non-staining cement was used.

In the interior the marble work was done by Batterson & Eisele, the staircase, panelling and columns of the banking room being exceedingly beautiful both in selection of material and in quality of workmanship in carving. Tavernelle Clair is used in the banking rooms in polished surfaces from floor to ceiling. The entrance hall and the elevator halls are trimmed with Botticino; the floors are of a light Tennessee of somewhat unusual shade. The marble floors were all surfaced by International floor machines. The tile floors in the basement were supplied by William H. Jackson Company, who also constructed the marble mantel on the 31st floor in the offices of J. P. Morgan & Company. The bronze work for the elevator doors, banking screens, partitions and staircase railings and the like, was done by the John Polachek Bronze and Iron Co.

The lighting fixtures were made by the Mitchell Vance Company, and in the banking room stories, Gleason Tiebout "Camia" glass was used in the fixtures, "Opalix" glass having been used in the fixtures elsewhere. The Frink system of artificial lighting is used in the banking rooms.

The W. G. Cornell Company did the plumbing, Loomis-Manning filters were used, and the temperature regulation is the system installed by the Johnson Service Company.

The engineer for the bank vault construction in the basement was Frederick S. Holmes. Throughout the building the hollow metal trim was installed by the Dahlstrom Metallic Door Company. Copper covered windows and bronze covered doors are used everywhere throughout the building. These were installed by M. F. Westergren, Inc.

The fire protection is provided for by stand pipes with Yale hose racks and hose furnished by the W. D. Allen Mfg. Co. on each floor. There are also fire bucket tanks furnished by the Safety Fire Extinguisher Co.

The eleven passenger elevators in the main battery are of the Otis gearless traction type. Five of the drum type are installed elsewhere. There are two Otis plunger sidewalk lifts. A vault lift was installed by the Standard Plunger Elevator Company. In the windows Grant overhead pulleys were used. Evans "Crescent" expansion bolts were employed in portions of the construction.

THE SIDE OF THE BANKING ROOM TOWARD NASSAU STREET.

Interior Marble. Batterson & Eisele. Trowbridge & Livingston, Architects.
Hollow Metal Trim: Dahlstrom Metallic Door Co.
Bronze Doors: John Polachek Bronze and Iron Co.
Copper Covered Windows and Bronze Covered Doors. M. F Westergren, Inc.
Lighting Fixtures: The Mitchell Vance Co.
Gleason-Tiebout "Camia" Glass in Lighting Fixtures

THE PROFITS OF AN ARCHITECT

By HOWARD M. INGHAM, PH. B.

HOW much net profit did you make on that house you finished last month?

What is the total cost of this set of plans on which you are just about ready to take figures?

How much did you lose on that competition where you did not take first or second prize?

How far away from your home city does it pay you to build a $10,000 house?

How far away can you afford to build a $30,000 building?

Should these distances be expressed in miles or hours?

How much work must you have on the books before it pays you to hire an outside superintendent, or to increase your force if you already have one?

The financial aspect of architecture as a profession is so vitally affected by these considerations that the answers should be instantly accessible in every office. A simple set of books will give the answers to all the specific questions, and to the general queries the answers are readily obtained by a little analysis.

Let us begin by assuming that the architect does not understand double-entry bookkeeping, and a set of books or a record of receipts and disbursements is kept by a stenographer or a draftsman No additional "talent" will be necessary for the system to be described.

The book consists of one or two hundred 9¼"x11⅞" "Extra Debit" ledger leaves, and an equal quantity of 4-column journal leaves of the same size.* (See Figures No. 2 and No. 3.) The latter are for the "Cost Accounts" of the several contracts, each of which has its own page. The ledger leaves are for the other accounts, as follows:

General Expense.

Yearly Business.

Furniture and Fixtures.

Cash.

Investment.

Every client for whom work is going on.

Every person who sells services or materials and renders a bill for them.

Each partner.

As soon as a contract is secured, the amount of it (that is, the amount the architect is to receive for his services) is entered under "Debit" on a ledger leaf which is headed with the client's name, and also under "Credit" on the ledger leaf headed "Yearly Business."† If the amount of the contract is a percentage of the cost of the building, and hence indeterminate until the work is completed, several entries, as described above, can be made at different times, as fast as any specific partial amounts can be determined.

As soon as the contract is entered, a cost account for the work is opened on one of the 4-column journal leaves. The heading consists of the client's name, or

*These leaves are stock forms, and cost about $0.90 per 100. A binder costs from $2.75 up. A supply of adjustable index tags with some extra gummed stickers for renewal purposes saves the trouble, time and expense due to an index.

†It is understood, of course, that one cardinal principle of double-entry bookkeeping is that every time any amount is debited to one account, it must be credited to another account. This makes the sum of all the debits in the ledger equal the sum of all credits, and makes the book balance. A simple illustration may assist in forming a clear conception of "Debit" and "Credit." Suppose the reader goes to a tailor where he has an account, and buys a suit, telling the tailor to charge it. As the words charge and debit mean the same thing, the tailor debits it in his books to the reader. Later, when the reader pays the bill, he expects the tailor to give him credit for the money. This the tailor does by entering the amount of the check on the credit side of the reader's account.

FIG. 1

For this example the working hours were assumed to be from 9 to 12 and from 1 to 5.30, Saturday from 9 to 1; 41½ hours per week.

the name of the building, with the words "Cost Account" immediately following in plain large letters. (If the letters are large and plain, there is less likelihood of an entry being made in the cost account which should be in the client's account, and vice versa.) The headings of the columns are as follows: Drafting; Superintendence; Prints, Drawings and Specifications; Miscellaneous and General Expense.‡

It is presumed that the time of draftsmen is kept separately on the different contracts and also the time of the traveling superintendents. When the money for salaries is drawn from the bank, the amount is entered in the "Cash" account, on the credit side, and the amounts of salaries chargeable to the various contracts are entered on the proper cost accounts, in the column headed "Drafting" of "Superintendence," as the case may be.§

In making this distribution, care must be taken that the debits are equal to the credits, and a little arbitrary juggling with the odd cents may be necessary. It is not likely that a draftsman's salary, divided by the number of hours worked per week, is a whole number. A convenient form of pay-roll and distribution sheet is illustrated in Fig. 1. Superintendents should be listed on the same sheet in a different place, so as not to confuse the totals, or could have a separate sheet. The columns could be made wider and divided in two so that hours as well as amounts could be set down. Draftsmen could use the same form for keeping track of their time. Each man would use a separate sheet, Monday's time going on the first line, Tuesday's on the second, and so forth.

A cash box may be kept in the office for petty expenses. An arbitrary amount, say $20.00, is drawn from the bank and placed in the box. No entry is made on the books of this amount, as the money has not yet been spent. As money is withdrawn from the box, a memorandum of the amount and the proper charge account is left, and each week a sum is drawn from the bank to bring the cash up to exactly $20.00. This sum is credited to "Cash," as are all withdrawals from the bank, and the items from which it is made up are charged to cost accounts under "Miscellaneous" or in the proper column, or to "General Expense," or to the correct account, whatever it may be.

When bills are received, say from the

‡These headings are suggested as describing four classes into which expenses will naturally fall. It might be desirable in some offices or on some contracts to divide the expenses differently, according to what information is particularly desired. Four columns, however, will usually provide for a segregation in sufficient detail.

§It will be noticed that there is no "Credit" side to the cost accounts. Theoretically, there should be one, but, as it is hard to conceive of a credit to a cost account in an architect's office, it is hardly likely that there would ever be any entries on the credit sides, even if they were provided for.

FIGURE 2—"EXTRA DEBIT" LEDGER LEAF.

blue-printer or the drafting material dealer, the amounts are entered on the credit side of the account headed with the dealer's name, and charged to the cost accounts under "Blue Prints" or to "General Expense," as the case may be. When these bills are paid, the amounts of the checks are credited to "Cash" and debited to the dealer to whom they are sent. The difference between the debit and credit sides of each of these accounts will therefore show how much money is owed to that particular person.

"General Expense" will be debited with all items not directly applicable to particular cost accounts, such as rent, telephone, (toll calls can frequently be directly charged to cost accounts, however, and help to tell the story if so charged), postage, stationery, supplies, etc. The guiding principle in determining whether to charge to cost accounts or to "General Expense" should be to place in the former all items directly applicable, but not to attempt to split hairs.

A large porportion of the cost of work will necessarily be accumulated in the general expense account, and, unless this is distributed among the cost accounts, the latter will fail to tell a true story. No one will deny that an architect requires an office and appurtenances in order to handle his work properly. If so, can anyone deny that the cost of maintaining that office is a part of the cost of his work just as much as is the salary of the draftsman who drew the plans?

The method of distribution is simple. Each month the general expense account is added up and divided into a number of parts equal to the number of contracts in hand in the office during that month. The parts should not be equal, but should be approximately proportional to the amount of time and thought bestowed upon the several contracts that month.

FIG. 3.

These are merely the entries illustrated in the Pay-Roll and Distribution Sheet, Fig. 1. Of course, by April 27th, there would be a great many entries on the cost account of a contract secured March 15th, the date on which this is charged to client in Fig. 2.

Judgment will dictate the proportions, and—as there is no possible way of arriving at an exact solution—it is needless to attempt to split hairs. The amounts applicable to the several cost accounts are entered in the proper columns, and, at the same time, entered on the credit side of the general expense account. This account is consequently wiped off the books once a month.

The simplest way to handle the cost of soliciting work is to charge it to "General Expense." If, however, it is desired to learn the cost of this important function of the business, a cost account can be opened, headed "Soliciting Work," to which all charges such as sketches, pictures and entertainments can be made. The cost of securing a contract could be picked out from this and transferred to the cost account of the contract, when the latter is opened. The balance spent on unsuccessful efforts would have to be transferred to "General Expense" every month or so. Both of these transfers would be made by crediting the amount to be transferred to "Soliciting Work" and debiting it to the cost account or to "General Expense." It is recommended, however, that no attempt be made to separate the cost of soliciting work from other general expense items.

The amounts drawn by the partners are debited to them on the pages devoted to their personal accounts, and credited "Cash."

As fast as remittances are received from clients, the amounts are entered on the credit sides of the clients' accounts and debited to "Cash." The difference between the debit and credit sides of each client's account will therefore show how much money he owes on account of his work.

It has been noted that all money received has been debited to the cash account, and all money withdrawn has been credited to same. It therefore follows that the difference between the two sides of this account represents the total cash assets of the business, and should, of course, agree with the bank balance, after the cash box fund, say $20.00, has been added to the latter.*

So far no mention has been made of the "Investment" account or "Furniture and Fixtures." The latter is self-explanatory. The former is only used at the opening of the books, and is credited with the assets brought into the business which are charged to the appropriate accounts. Thus, the value of the office furniture and fixtures is debited to that account and credited to "Investment"; the cash in bank is debited to "Cash" and credited to "Investment"; unpaid balances due from clients are debited to them and credited to "Investment"; debts due are credited to the proper parties and debited to "Investment."

At any time, if entries have been correctly made, the sum of all the totals on the debit side of the ledger will equal the sum of all the totals on the credit side. A list of these totals set opposite the names of the accounts is called a trial balance. Books are made for this purpose which reduce the writing required to the lowest possible minimum. It might be mentioned that a monthly trial balance would be comparatively little trouble, while, if neglected for a year, it would probably consume more than twelve times as much effort.

If it is desired to charge the time of the principals of the business to cost accounts, this can readily be done by fixing some arbitrary rate per hour, and charging this in the "Superintendence" column, crediting the same amounts, of

*If the cash account is conceived to be an account with the bank, a customer who buys money from the reader, the debits and credits to this account will be clear. When money is deposited in the bank, the latter is buying money from the depositor, who therefore charges it to the bank, as a tailor charges a suit of clothes to a customer he trusts. When the reader draws a check, the bank is paying its bill for part of the money it bought a little while before, so the reader must give the bank credit for this payment on the cash account.

course, to the personal account of the principal. The principal's account might thus be conceived to show on the credit side what he has earned, and on the debit side what he has drawn.

If this is done regularly, and the profits on contracts (obtained by deducting the total cost account from the total received from client) are still considerable, it shows that a surplus is being accumulated, and the principal can afford to increase his drawing account, if he so desires. It is to be hoped that the converse will never appear!

The division of the principal's time will not be a nuisance, and will furnish a valuable record in the books. Nearly everybody carries an engagement book or diary. It is a simple matter, when traveling in a train or street car, to make a few notes in the book which will indicate the work to which the previous day was devoted. Probably a half dozen words each day will suffice. Accuracy is impossible and not at all necessary. The purpose would be almost as well served if the division were made each day by the "right-hand-man" of the office, who usually knows fairly well what the principal is doing, or what he was doing yesterday. If the architect does a considerable amount of his own superintending, a division of his time is indispensable if he wants to find out what work pays and what work does not.

With a set of books kept in this fashion the ledger itself becomes each month a financial statement; it is unnecessary to wait until the end of the year to see how much money the business is really earning.

A competition should be treated as if it were a contract from a client, and a cost account should be opened for it. Prizes can be entered exactly as if they were remittances from the client. If no prizes are won, the whole cost, showing on the books on the debit side with nothing to balance it on the credit side, will reduce the total earnings of the business by just that amount.

The analysis of the books to obtain the answers to the last four questions propounded at the beginning of this article will not be touched upon at this time, as it is a problem entirely separate from the keeping of the books. It cannot be logically attempted until quite a number of cost accounts have been kept by this method, or a large number of hypothetical cases worked out in considerable detail from reliable data.

THE HOLLOW-TILE FIREPROOF HOUSE

Article VIII—Permanent Tile Forms in Factory Construction

By FREDERICK SQUIRES

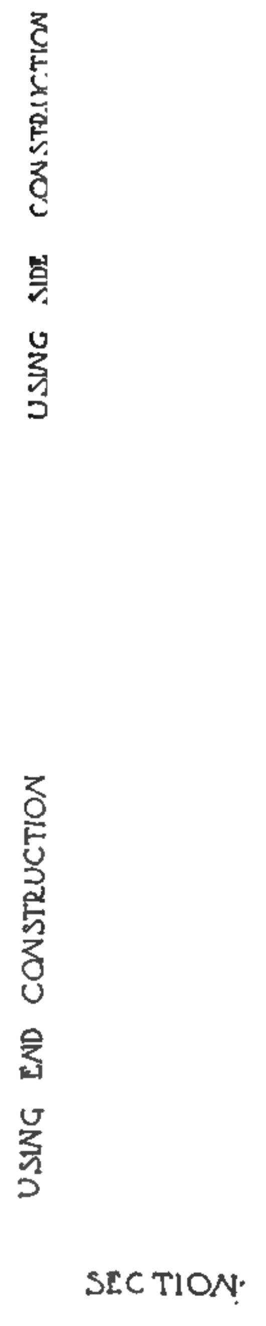
THE use of permanent hollow tile forms in pier construction next engages our attention. In this connection it may be well to say something about the method of manufacture which accounts for the physical appearance of the hollow tile block. The thickness of a piece of clay that can be burned successfully is limited to the thickness of the ordinary brick. When a bigger piece of clay is to be burned it must be so divided that the fire can get at more than .just the outer surface and the only way to do this is to make it cellular. The only practical way to make a lump of clay cellular is to force it through a die, and this means that the cells must all run one way. After the clay has been forced through the die and has come out in cellular form it must be cut across at right angles to the cells in pieces of convenient length usually about one foot long, and these pieces must be dried out a little and set up on end in kilns and subjected to fire. In the upright position, there is no part of the cellular block which offers any great thickness of clay to the fire and so it is readily burned to the proper degree of hardness. It is the requirements of this manufacturing process then, and no other causes, which give us a hollow-tile building block with the physical aspect in which we find it at the building. Were it not for the limitations of moulding and burning clay, the block might be any other shape. Given, then, a large building block with cells running in one direction only and open on two of its six sides our problem is to make the best use of it as a building material. It would seem to be the best way to lay these blocks in a wall on their closed sides so as to get a good mortar bed, but on closer observation it is apparent that by so doing only a part of the cross-section of the terra-cotta is in compression. The block must have its webs vertical in order to make use of all of its cross-section. But when set vertically the mortar bed must be on the webs of the lower block and not on a plane surface and we are therefore confronted with the difficult feat of balancing mortar on a five-eighth-inch web and bedding a forty-pound block on this pre-

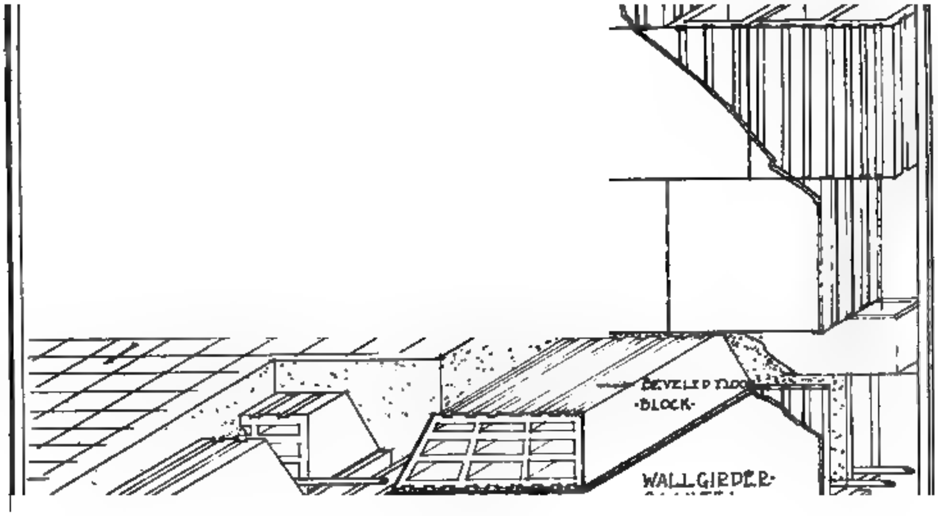
THE WHITALL-TATUM CO. FACTORY.

INTERIOR OF THE FULLY FIREPROOFED SECTION.

carious footing. It is apparent that unless this circus feat is successfully performed the blocks will come in contact vertically only at points and not all along the webs and that not all of the cross-section can be counted on to do work. This causes no inconvenience in houses where the wall is far stronger than required by the load, but it becomes a problem to take into account in heavily loaded pier construction.

Although the placing of the blocks in the wall with the cores vertical does not present a very good horizontal mortar bed, yet it invites a far more powerful construction than any mortared unit, namely, the introduction of concrete grouting. Just as the cores must be vertical in the process of manufacture to allow the fire to take its characteristic upward course, so the cores must be vertical in construction work to let the liquid concrete take its characteristic downward flow. This grouting makes it possible to count on every particle of tile in compression. It is, of course, necessary to




·BLOCK·
WALLGIRDER·

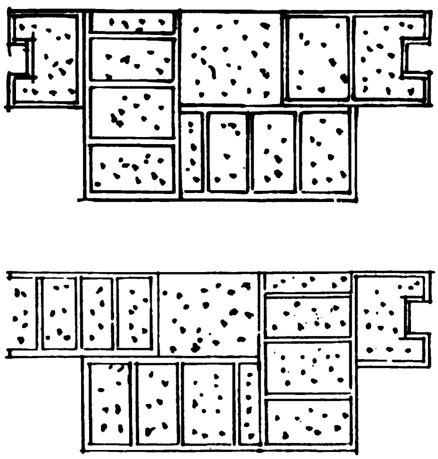
THE ROOF AND THE SKYLIGHTS.

design the webs so that when blocks are placed one upon another with the joints broken the webs and cores will correspond and the vertical channels be uninterrupted. I have noted in previous articles the value of the air space in the hollow wall as a non-conductor of changes in temperature, in other words, its furring value. Now it would seem that I am advocating the destruction of this furring in order to obtain greater structural strength. But it is easy to retain both in the same wall, although in general practice, the advocates of each are apt to neglect or omit the other. It is quite practicable to design a block, some of whose cells, either on the inner or outer side of the wall, shall be grouted and the remaining cells left open for furring. Since the floor loads are more easily applied to the inner than to the outer surface of the wall, the furring space may better be designed for the outer surface of the block. Where the construction is that of a bonding wall as in "Texture-Tile," the "Texture-Tile" block forms an ideal furring for a grouted backing, as shown in the illustration. End construction "Texture-Tile," where the cores are horizontal, forms a better insulation than vertical cores, the air in which is apt to be in circulation, owing to the tendency of heated air to rise in the vertical chambers. The bonding course can readily be designed to tie in with the grouted backing. In designing a block for vertical grouting, it is well to make a double web in the center to provide a bearing for the webs above with an allowance for the joints between the blocks.

The final illustration shows a method of constructing all parts of a factory building in permanent hollow-tile forms. In order not to complicate the drawing the scheme for furring blocks just described has been omitted. The Whitall-Tatum factory employed many of the underlying principles shown in the last drawing. In part of the building, permanent tile floor forms were used, but not of so advanced a type as the beveled block two-way system.

The lintels and girders were of concrete, but not in permanent hollow-tile forms. For this reason they could not be plastered. Piers were originally designed like the piers here shown, but lack of time kept the contractor from making the special die. He was allowed to substitute a permanent tile form built of small blocks surrounding a large central core which was reinforced and poured with concrete. All the curtain wall tile were interlocked by grouting, but this, I believe, to have been a waste of good steel and concrete as these curtain walls will never be called on to take any load.

Stucco and plaster on tile have taken away all the gloom of the average red



THE PERMANENT TILE FORMS BUILT OF SMALL BLOCKS EMPLOYED IN THE CONSTRUCTION OF THE WHITALL-TATUM CO. FACTORY.

brick and mill-constructed factory and have replaced it with brightness and good cheer.

The Whitall-Tatum Company factory had another virtue beside good construction. It was cheap. Built in a brick country, with its footings actually in brick clay, it was built of concrete, in permanent tile forms, at a lower figure than any of the proposals to do the work in brick.

In concluding this article on permanent hollow tile forms in factory construction, I would say that such forms offer the advantage of a positive surface for plaster and stucco. In the case of floors they give depth to the beam lightness to the construction and the part of the tile above the neutral axis of the beams does actual structural work in compression. As lintel and girder forms they permit speedy work in erection and in the case of the wall girder may be built on before the concrete is set. The strength of the pier may be increased by grouting without wasting material on the curtain walls, or piers may be dispensed with and a wall of uniform thickness, but of varying bearing capacity be readily produced. Also adequate furring spaces may be retained. All this may be done,—strong, light floors, quickly erected girders and lintels, powerful piers, sure plastering surfaces obtained, and in the end the finished product will stand the final test —Economy.

THE CHICAGO TELEPHONE BUILDING, CHICAGO, ILL.

Interior Woodwork: Matthews Bro.'s Mfg. Co. Holabird & Roche, Architects.
Evans' Crescent Expansion Bolts Used.
Star Expansion Bolts Used.
Newman Watchclock System.
Red Core Insulated Wire: Habirshaw Wire Co.
Hose Racks (Yale) and Hose: W. D. Allen Mfg. Co.
Ornamental Iron and Bronze: The Standard Company.

STUDENTS' DETAILS OF CONSTRUCTION

Architectural Department, University of Pennsylvania

THE town hall shown in the first of the students' drawings of the department of architecture of the University of Pennsylvania in this issue illustrates the student's constructional scheme of a portion of this building. The problem in design was for a town hall to be located on one side of a public square around which were to be grouped other municipal buildings. In the program for the design problem the questions of site, the basement, first story, second story and dimensions were all given and the requirements stated in regard to the number of drawings, the scale, the time for completion, etc. In the drawings the elevation of one of the end bays is shown and the remainder of the sheet is given up to detailed drawings of the construction of the various portions of this bay drawn to a scale on the original drawing of ¾-inch to the foot. The drawings show the student's solution of the construction, including the dressed-stone facing and dormer window and balustrades, the fireproof mansard roof, the fireproof floors, the interior finish, the steel supports, etc.

As has been stated before, regarding these drawings illustrating the coordination of design and construction in the scheme of architectural education in our schools, the drawings themselves may show the occasional and unavoidable inaccuracies of students' work; but they are generally correct, acceptable and approved examples of architectural construction—practical in every sense of the word. Of course, the beginners, the first and second-year men in the schools, are unable to undertake problems of this character, which are given to the upper classmen only; but it is observed that even in these younger men a much greater interest is taken in the most elementary principles of construction, as they see the possibilities of its further development and its practical application later on to their own problems in design.

The second illustration shows a portion of the front elevation of a war museum and details of the construction of portions of the same. In the design problem for this, a portion of the statement of the problem read as follows: "In Richmond, Va., it is proposed to erect a building which is to serve as a repository and exhibition hall for Confederate relics, paintings and sculpture, together with writings and other data relating to the late Confederacy. It is to be on the order of a small museum and art-gallery combined, is intended to be the final place of deposit for collections of Confederate relics and data, and is to serve, in regard to both its exterior and interior, as a memorial building for the placing from time to time of commemorative tablets and statues. The style of the building should be of a dignified, monumental character."

The above quotation will serve to indicate the nature of the problem as far as design is concerned. The program, of course, goes much further into detail in regard to questions of planning, method of lighting, area of the building, etc.

The sheet containing illustrations from this problem by the students taking the course in construction shows one-half elevation to a small scale of the main building and the rest of the sheet is devoted to scale details drawn to ¾-inch to the foot.

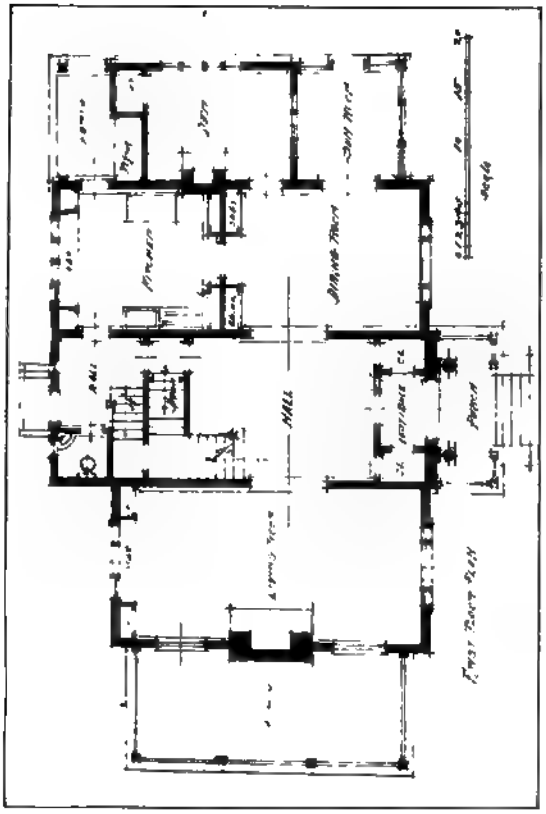
Designed by Charles G. Beersman.

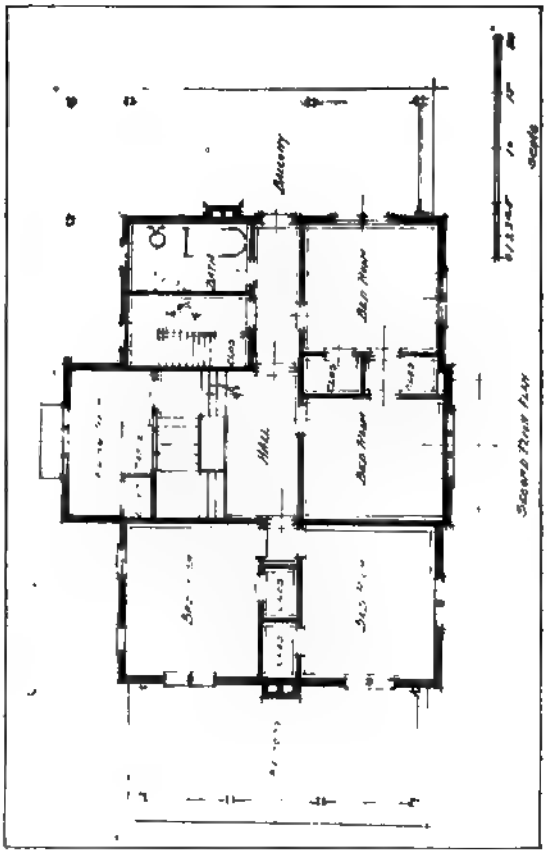
Designed by George Dick.

THE PALAIS ROYAL DEPARTMENT STORE, WASHINGTON, D. C.

G. P. Hales, Architect.

Electrical Contractors: Carroll Electric Co. Otis Elevators.
Fireproof Windows: David Lupton's Sons Co.
Thermostats: Johnson Service Co.
Painting and Decorating: W. F. Andrews.
Evans' Crescent Expansion Bolts Used.
Newman Watchclock System
Standard Plunger Passenger Elevators and Dumbwaiter.





RESIDENCE OF J. M. SPARKMAN, SEATTLE, WASHINGTON.
Wilson & Loveless, Architects.

H. W. JOHNS-MANVILLE CO. BUILDING, 41ST ST. AND MADISON AVE., NEW YORK.

Augustus N. Allen, Architect.

Cement Sidewalks: Denton & Co.
Otis Elevators
Star Expansion Bolts Used

H. W. JOHNS-MANVILLE CO. BUILDING. HALL TO EXECUTIVE OFFICES, 11TH FLOOR. RETAIL DEPARTMENT, 1ST FLOOR.

Floors: Denton & Co. Augustus N. Allen, Architect.
Evans' Crescent Expansion Bolts Used.
Ornamental Plaster and Artificial Decorative Stone: Jacobson & Co.
Metropolitan Push Button Switches Used.

The Johns-Manville building was designed by Augustus N. Allen. The William Crawford Co. were the builders. Throughout the construction the varied products for use in building construction made by the H. W. Johns-Manville Company were employed. Sidewalks and cement floors were laid by Denton & Company. The ornamental plaster and stone decoration were done by Jacobson & Company.

The Manice building was designed by Wallace and Goodwillie. It has been built on a site formerly occupied by four of Madison Avenue's old brown stone residences at the corner of Madison Avenue and 32d Street. The building is twelve-stories in height and is of steel frame construction. The Empire Holding Co. erected the building. The structural steel was erected by the Radley Steel Construction Co. The painting and decorating were done by John P. Bengtson.

This building is protected by an automatic sprinkler system, which was installed by the Rockwood Sprinkler Co.

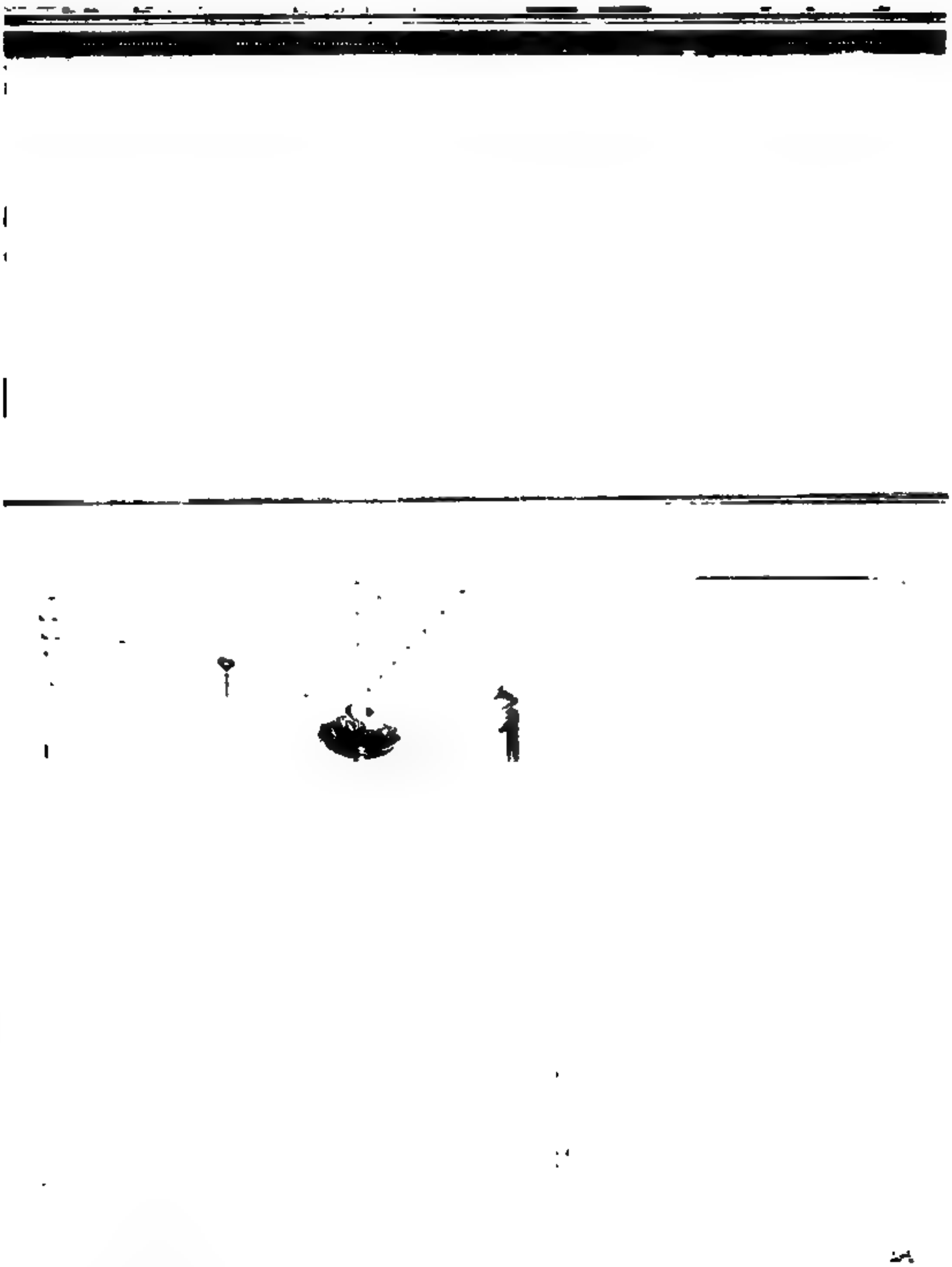
The Frances building fronts 85 feet on Fifth Avenue and 125 feet on 53d Street.

(Continued on page 18 advertisements.)

THE MANICE BUILDING HALL AND CONSTRUCTION VIEW.
Structural Steel: Radley Steel Construction Co. Wallace & Goodwillie, Architects.
Rockwood Automatic Sprinkler Equipment.
Ornamental Iron: The Madison Iron Works.

THE MANICE BUILDING, 32D STREET AND MADISON AVENUE, NEW YORK.

Painting and Decorating: John P. Bengtson. Wallace & Goodwillie, Architects.
Star Expansion Bolts Used.
Structural Steel: Radley Steel Construction Co.
Ornamental Iron: The Madison Iron Works.



ENTRANCE AND HALLWAY OF THE FRANCES BUILDING.

Corbin Hardware. C. P. H. Gilbert, Architect.
American Steel Side Sash Pulleys Used.
Grinnell Automatic Sprinkler Protection
Bronze Store Fronts and Bronze Grills: The Gorham Co.

THE FRANCES BUILDING, 53D STREET AND 5TH AVENUE, NEW YORK.

Fireproof Windows. S. H. Pomeroy Co., Inc. C. P. H. Gilbert, Architect.
Electrical Contractor: J. Livingston & Co.
Copper Work and Cornices: Architectural Metal Works.
Otis Elevators.

CHICAGO, BURLINGTON AND QUINCY RAILROAD CO. BUILDING, CHICAGO, ILL.
Boilers: Murray Iron Works Co. Marshall & Fox, Architects.
Terra-Cotta: Northwestern Terra-Cotta Co.

The exterior is of classic design, made up wholly of buff limestone, with a main entrance finished in Hauteville marble. The first story is fitted for high class stores, while the upper floors are arranged for offices. There are five Otis elevators of the traction type. All the upper halls and stairs are finished in Hauteville marble.

The Frances Building, designed by C. P. H. Gilbert, and built by Charles A. Cowen & Co., is equipped with fireproof windows supplied by S. H. Pomeroy Co., Inc. The copper work and cornices were supplied by the Architectural Metal Works. J. Livingston & Company were the electrical contractors, and the hardware was manufactured by P. and F. Corbin. J. J. Spurr & Son furnished the limestone; Sayre & Fisher Co. furnished the brick; the terracotta was supplied by the N. Y. Architectural Terra-Cotta Co., and the bronze work was done by the Gorham Co.

The building is protected by an automatic sprinkler system, installed by the General Fire Extinguisher Co.

The new general office building of the Chicago, Burlington & Quincy Railroad Co. was designed by Marshall & Fox. The design shows a 19-story structure, and the permit calls for a building of such a height, but only 15 stories are now being erected. The exterior is of enameled brick and terracotta supplied by the Northwestern Terra Cotta Co. McNulty Bros. did the plastering. The boiler equipment was put in by the Murray Iron Works Co.

BOOK REVIEWS

REINFORCED CONCRETE BUILDINGS. By Ernest L. Ransome and Alexis Saurbrey. New York: McGraw-Hill Book Company. Price, $2.50 net.

This volume presents matters of interest to an experienced engineer concerning reinforced concrete. It is not written for the practical or the untrained man. It is not an encyclopedia of civil and hydraulic engineering. But, on the other hand, it contains much information not elsewhere readily obtainable in its history of reinforced concrete and its reference to basic patents. So much for the first part of the work. The second part deals with the theoretical analysis of structural members. The third part deals with practical construction. Throughout there are to be found well chosen illustrations both of early work and of recent and most approved construction. A short chapter on accidents sounds a warning against careless construction, but even more against careless and ignorant design which, we may safely say, is, in the opinion of most experts in concrete, the underlying cause of failures. In closing the chapter the authors say "Tie all steel bars into the next span. Use closely spaced hoops in all columns. And see that the concrete is hard before the shores are removed."

CONCRETE AND STUCCO HOUSES. By Oswald Hering, A. I. A. New York: McBride, Nast & Co. Price, $2 net; postage 20 cents.

This book is even more than its title indicates; or even than is indicated by that title which the author states in his preface was his original conception, but which was too unwieldy for use as a title. The use and abuse of concrete and stucco in their application to the rural and suburban architecture of America. The book is really a delightful essay on suburban residence life and architecture. In the brief text Mr. Hering tells us of the advantage of location or the setting of the house, and shows in splendid illustrations some suburban developments which may be considered successful from the standpoint of their units,—the homes therein,—and the setting as a whole, or the landscape effect of the entire tracts. The first portion, under the title of "country and suburban development," forms an introductory to his conception of the house itself. In the following pages the well chosen and beautiful illustrations supplement the text in a true sense. The book is not technical. Mr. Hering has written it more directly to the man who proposes to build than to the architectural profession, and a perusal of its pages should leave the average reader generally informed as to the various methods of constructing a stucco or concrete house, and constructing it well. Mr. Hering has considered both stucco on a wooden frame and fully fireproof construction. The closing chapter of the essay is entitled the "Dawn of American Architecture." In this Mr. Hering moralizes architecturally and interestingly, pointing out that in reinforced concrete we may develop a new—and lasting—American architecture.

SUBURBAN HOMES WITH CONSTRUCTIVE DETAILS by Numerous Architects. Second Edition, completely revised. Published by the David Williams Co., New York. Price, $1.00.

This is the fourth volume of the Building Age series of designs. The designs have been selected with a view to bringing out some particular feature of each that is of more than usual interest. The illustrations show a few brick and stone structures, but the greater number are of frame construction covered with either shingle or stucco, and the costs of the houses range from $4,000 to $24,000. There are twenty-three designs in all, the work of reputable architects. While the buildings shown will undoubtedly be adversely criticized

(*Continued on page 32*)

Art and Architecture

THE REPEAL OF THE TARSNEY ACT.

As a rider on the Sundry Civil bill we find another objectionable piece of legislation in the repeal of the Tarsney act. This act, passed some fifteen years ago, empowered the Secretary of the Treasury at his discretion to obtain plans in competition from architects in private practice for public buildings erected by the Treasury Department. This included the majority of Federal buildings, and the result of the act has been to bring about a great improvement in the architectural design of our public buildings throughout the country. The New York Custom House as an architectural example far exceeds the Mullet post office, and with the improvement in the standard of our public taste, it will be a source of regret to the public at large as well as to the architectural profession if this reversion to the system which produced the latter building should take place. The repeal of the Tarsney act unless some better provision for the design of public buildings is at once made, would mean that the ability of the architectural talent of the country would no longer be exercised in the production of our public buildings, and that all public buildings would be erected by the supervising architect of the Treasury as sole authority. Provided that the occupant of that position was of the greatest possible personal ability, possessing the broadest conceivable ideas as to the architectural styles and the fitness of them to sites, it is inconceivable that such an individual could in any way equal the results of the present competitive method which attracts the brains and ingenuity of the architectural profession at large to compete in the designing and beautifying of our public buildings which are, in a sense, the monuments of the nation.

The following contribution voices a different opinion of the Tarsney Act:

THE "TARSNEY" ACT.

In some quarters there is heard a wail because Congress plans the abolishing of the "Tarsney" act, that legislation whereby the biggest Government buildings have been given out to private architects via the competition route. That those of the inner circle who have generally secured the plums should wail is understandable, but that the profession generally should protest simply goes to show how abjectly the rank and file follow the lead and uphold the interests of the aforesaid "inner circle." The profession at large has not been benefited by the Tarsney act, nor has it been of advantage to the Government, and therefore to the people generally.

The proposed repeal is in the Sundry Civil Bill, so is more than apt to pass whether the Institute protests or not. That protest, as far as the rank and file are concerned, is perfunctory, and simply because the act originated in the Institute. A case of upholding a thing because one suggested it, and utterly regardless of whether it did good or harm, what is called a "blind partisan support."

I think I am perfectly safe in saying that the legislation has done no good. The buildings carried on by private architects have been no better than the regular governmental product, have been the cause of endless rows and trouble, and have cost more to produce than those done in the usual way. I have followed the Tarsney Act products rather carefully, have had much to do with some and believe that I am competent to affirm that that legislative effort is a good one—to repeal.

The private architect has to get his information from the Supervising Architect in order to plan the building. The latter office, in the natural course of things, must have forgotten more about the needs of a government building than the private practitioner can learn in a lifetime. Then the supervision of the work is done by the regular Government force anyway; so are the accounts kept by it. It all means endless duplication of work by Department and private practitioner. Really the only thing the latter rules supremely is the artistic part, the exterior design and the interior finish. And I fail to find a solitary instance where the private architect has produced a handsomer, a more artistic structure than those designed by the Supervising Architect's office.

The Tarsney Act was passed because the Government work had been so abominably ugly and because of the endless scandals and crookedness that had existed in handling it. But contemporaneous legislation and new appointments cleaned up that office, and so effectually that for a long time now it has been known that the Tarsney Act was simply a means of giving good fat commissions and extra renown to a few select architects and not the remedial legislation it was originally planned to be.

A much better scheme would seem to be "collaboration" rather than these so-called "Tarsney Competitions." Let the Supervising Architect's office design and carry on and build the Govern-

ment buildings. It is the best equipped and most capable office in the land for that function, anyway. Then appoint and pay a "Collaborating Commission" of private architects to work with the Supervising Architect to secure the best and most artistic structure possible. That is in the big cities only, of course, buildings of $300,000 or over. Let it be a local commission, three or four of the best local architects, men of ability, men elected for that work by their fellows or local Chapter of the A. I. A.

Such a Board of Commissioners will have local pride enough to really exercise its privileges of criticism and suggestion, and see to it that that building will be one worth while; the knowledge that there is to be such a Board that will go over its work will keep the Supervising Architect's office always keyed up to its best, and the combination of the two bodies, really collaborating and working together, cannot fail but produce infinitely better results than that achieved by an individual who has merely happened to hit the fancy of the best talker of the judges who preside in the more or less farcical competition performance.

The Government competition is pretty sure to be a dead letter ere this is in print, and I would most earnestly advise the architects to clamor for "COLLABORATION" as a new plank in their platform. A trial is the least that could be done. If they want it let them get busy and approve of the scheme to their legislators and representatives to whom it will already have been suggested.

F. W. FITZPATRICK.

Coupled with this proposed legislation, we cannot refrain from commenting upon the fact that Mr. Walter B. Griffin, of Chicago, has just won the first prize of $8,750 in the international competition for the new capital city of Australia. This prize was won amid an assemblage of the famous architects of the world, it may be said, and the winning design of this great competition will unquestionably make the four-mile square of the new Australian federal territory one of the finest examples of civic and governmental architecture to be found in the world. That other governments appreciate the value of the competitive method there can be no better evidence. The site of this Australian "District of Columbia" is an elevated plateau 165 miles southwest of Sidney, in New South Wales. It is encircled with hills and very well watered, presenting an ideal location for a federal city. The competition won by Mr. Griffin was not for the design of individual buildings, but for the municipal scheme. What L'Enfant did for America, in designing our capital at Washington, we may hope that Mr. Griffin may produce for Australia.

THE ART OF COMBUSTIBLE ARCHITECTURE.

This is the title given by Edward Atkinson to the art, under the practice of which the rule of danger rather than of safety marks nine out of ten of the works, warehouses, hotels, hospitals, churches and other principal buildings of the United States. Referring to college and schoolhouses, of which 485 were burned in one year, he had "never found a class of building in which heavy damage or complete destruction had been more adequately provided for by the masters of combustible architecture."

Referring to churches and to a proposition for organizing a mutual insurance company for the insurance and prevention of fire in churches, of which about twelve are burned per week, he states that church members "by such a combination might be assured against cremation in this world, if not in the next."

(Continued on page 34)

OBITUARY

John Thatcher, Superintendent of Buildings for the Borough of Brooklyn, was accidentally killed by the falling of a scaffold while in the pursuit of his duties of inspecting a building. Previous to his service as Superintendent of Buildings, Mr. Thatcher was Superintendent of Sewers. He was formerly a member of John Thatcher & Son, Builders, and as the head of that firm constructed many important buildings in Brooklyn and Manhattan. Mr. Thatcher was 59 years old, and is survived by his wife, son, and four daughters.

Fireproofing and Fire-Protection

MR. G. H. STEWART

AN ACT TO AMEND THE LABOR LAW, IN RELATION TO AUTOMATIC SPRINKLERS.

Became a law April 15, 1912, with the approval of the Governor. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein a new section, to be section eighty-three-b, to read as follows:

§83-b. Automatic sprinklers. In every factory building over seven stories or over ninety feet in height in which wooden flooring or wooden trim is used and more than two hundred people are regularly employed above the seventh floor or more than ninety feet above the ground level of such building, the owner of the building shall install an automatic sprinkler system approved as to form and manner in the city of New York by the fire commissioner of such city, and elsewhere, by the State fire marshal. Such installation shall be made within one year after this section takes effect, but the fire commissioner of the city of New York in such city and the State fire marshal elsewhere may, for good cause shown, extend such time for an additional year. A failure to comply with this section shall be a misdemeanor as provided by section twelve hundred and seventy-five of the penal law and the provisions hereof shall also be enforced in the city of New York by the fire commissioner of such city in the manner provided by title three of chapter fifteen of the Greater New York charter, and elsewhere by the State fire marshal in the manner provided by article ten-a of the insurance law.

§2. This act shall take effect immediately,

A LESSON THAT WAS NEEDED.

Fire last spring completely destroyed a department store in Reading, Pa., the loss as finally adjusted with the insurance companies being $269,000. The new building, five stories in height, is of fireproof construction, but to take care of the valuable and burnable contents a complete system of automatic sprinklers has been installed, served by a large gravity tank and a pressure tank on the roof.

The subdivision of the losses as adjusted shows how very important the question of contents is as compared with buildings. The adjusted loss on the building was $39,300; on merchandise and fixtures the figure was $229,700, which is about 85 per cent. of the total. The ordinary concrete or other form of fireproof building is itself proof again burning, but it gives only a very limited protection to its contents. This makes the use of automatic sprinklers almost imperative in cases where large values are brought together, as in department stores or similar establishments.

A NEW SPRINKLER CO.

A new company, known as the United States Automatic Sprinkler Company, has recently been formed to engage in the business of manufacturing and installing fire equipments—pumps, hydrant systems and fire protection appliances. The company has executive offices at 258 Broadway, New York City, and several machine shops and a large warehouse in Brooklyn. The president of the new company is Mr. W. Gerald Hawes, who is a well-known engineer in the fire protection and insurance fields. A. B. and W. A. Crowder, of St. Louis, Mo., inventors and patentees of the Crowder sprinkler head, constitute an advisory board for the United States Automatic Sprinkler Company, and Mr. Milton C. Henley is the company's vice-president and general manager. One of the main products of this company is the Crowder sprinkler head, which has attained an excellent reputation for general efficiency in the fire protection industry in St. Louis and the West.

FIRE PREVENTIVE APPARATUS IN THE BUILDING.

The equipment of a building with apparatus for the extinguishment of fire is so usual nowadays that in a large modern building it would be an occasion for very serious criticism if such equipment were omitted even if according to the municipal regulations of various cities such omission were possible. The requirements of municipal departments and the underwriters specify that apparatus must be up to a certain standard of material, form and efficiency of operation. The installation in a lofty building of a standpipe with hose valves at every floor, connecting with which is a sufficient length of hose and a suitable rack for its support, is a much more serious proposition than might at first be supposed. The greater the height, the greater the pressure at the base of the standpipe, and thus the necessity for heavy piping and properly installed equipment. On the other hand, according to the design of the building, hose racks may be of a great variety of patterns.

The number of designs of the Bowes hose rack on the market make possible a selection

(Continued on page 26)

ROCKWOOD SAFETY LOOP SPRINKLER

SHOWING SPRINKLER WITH THE TWO HALVES OF THE STRUT SOLDERED TOGETHER.

SHOWING HOW THE TWO PARTS OF THE SOLDERED STRUT SPRING APART *ONLY AFTER* THE LUMP OF SOLDER IS *MELTED* AWAY FROM THE LOOP.

THE ROCKWOOD SPRINKLER IS UNIQUE IN THAT THE TWO PARTS OF THE SOLDERED LINK ARE HELD TOGETHER, NOT MERELY BY A SWEATED SOLDERED JOINT, BUT BY COVERING THE END OF THE LEVER WITH A SMALL PIECE OF SOLDER WHICH IS MECHANICALLY BOUND TO THE STRUT BY A LOOP OF WIRE RIVETED THROUGH ONE PART OF THE LINK.

THE ROCKWOOD SPRINKLER IS THE ONLY APPROVED HEAD THAT IS INCAPABLE OF OPENING ITSELF BY THE BREAKING OF THE SOLDERED JOINT, WHICH MUST ABSOLUTELY MELT TO OPEN. IT IS THUS IN A CLASS BY ITSELF, SUPERIOR TO ALL OTHERS.

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for almost any purpose. The racks may be fastened to the standpipe, the wall, or a nipple on the valve, making them adaptable to almost any arrangement. The hose is supported on a series of pins which, as the hose is drawn out for service, remain on one arm of the rack where they are securely attached so that they cannot be lost or destroyed. The Yale hose rack operates on a different principle, the hose being supported by a series of clamps so arranged that no pressure is placed upon the folds of the hose. Other devices for carrying hose are the Dewey and the Hartford swinging hose racks in which the hose is laid up fold upon fold and supported entirely from the bottom. The Ryerson swinging hose reel carries the hose in a wound form, as its name would indicate.

These devices described above are made by the W. D. Allen Manufacturing Company, of 2318-2324 Western Avenue, Chicago, with a New York office at 69 Warren Street. They will supply a full catalogue of their line upon request.

A FIVE YEARS' FIGHT AGAINST FIRE.

A good-sized pamphlet by Powell Evans bears the title given above. The pamphlet contains a series of addresses showing the growth of the idea within the five years from 1908 to 1912, inclusive. Its intent is to encourage methods and popular feeling tending towards the control of fire in the United States, and its prevention by protective methods and devices as well as forms of construction.

It may be said that the book is up to the minute. It starts with correspondence as late as May 15, 1912, and deals with subjects as recent as the National Fire Protection Association meeting held last month in Chicago. The book is a commendation of Mr. Powell's interest and activity which has led him in a disinterested way to spend a great deal of his effort in the cause of fire-prevention.

IS IT ALL UP TO THE ELEVATORS?

We make the following quotation from the New York Lumber Trade Journal:—

"No modern skyscraper, even one of modest proportions, could be built with wooden beams, but any modern skyscraper can be trimmed in wood and the fire risk not accentuated a particle if the building is otherwise properly built.

(*Continued on page* 30)

"In the first place, every elevator should run in its own shaft, which shaft should be of fireproof construction and practically air tight, and so strong that should an elevator drop it would be stopped by the air cushion created by its own momentum.

"No two elevators should run in the same shaft. As it is now, as many as two, and even up to ten or twelve, sometimes run sid in one large, open shaft, and these sh nect with every floor in anything bu tight way.

"No elevator should connect at all floor below the ground floor, and w shaft goes down below the ground level floor, access to it should be f ground floor as to a well."

The truth of all this is unquestione application is the misconception. W draw the conclusion that if all the in the building were built of wood with wooden doors to their hallways, they would present no fire menace. Wooden trim has its place, but its misuse should be recognized and restrained. To make a modern skyscraper fireproof, wood should not enter into it structurally in any way. Hollow metal is so presentable that in its finer finishes it can be told from wood only by an expert and it does not burn. We believe that every time wooden doors and trim or window sash and frames are put into a new loft or office building, it is a step backwards and a flight into the face of Providence. The recommendations for elevator shaft construction are undoubtedly good, but present the extreme refinement of safety, but that they should be used as an argument for triming the entire interior of the building with wood is a misrepresentation.

the present time, and will be found of interest to all desiring to study the subject consecutively. Beautifully illustrated by many full-page plates giving examples of Colonial

BOOK REVIEWS.

(*Continued from page* 18)

by many architectural designers, the book possesses the merit of having many good structural details and drawings which are of simple nature and should be useful in explaining the constructive work to carpenters and builders. The plans of the houses are in the main sensible and of suggestive value. The elevation drawings do not possess the same attraction, and could be for the most part omitted without damage to the appearance or value of the book.

PRACTICAL METHODS OF SEWAGE DISPOSAL. By Henry N. Ogden, M. Am. Soc. C. E., and H. Burdett Cleveland, Assoc. M. Am. Soc. C. E. New York: John Wiley & Sons. Price, $1.50 net.

This is a very practical book and one that could convey much very valuable information to a very large proportion of our country house owners. It is non-technical in character, but it contains sufficiently detailed descriptions to give the non-technical reader a good working idea of what he needs for practical and efficient sewage disposal. The uses of the septic tank, sewage filter, sub-surface irrigation, broad irrigation, valves, syphons and syphon chambers, and finally estimates of cost, are treated, and installations which would be suitable for a single house or a hotel or institution are described. Throughout the text there are numerous diagrammatic illustrations which give a clear idea of the appliances and materials which may be either purchased or constructed.

AMERICAN COUNTRY HOUSES OF TODAY, 1912. Large quarto, bound in buckram gilt. New York: The Architectural Book Publishing Co. Price, $12.50 net.

This book, printed on a heavy, coated paper, with pages over 9 by 12 inches, contains 183 plates which are all printed on one side of the page. From the standpoint of illustrative work, the half-tones, which are made from the best of photographs, are very near perfection in their class. Beyond the captions, there are no descriptions of the houses illustrated. The only text in the book is the preface which was written by Mr. Frank Miles Day, in which he says that "The houses shown in this book are fairly representative of types usual at present along the Atlantic seaboard." The list of contributors contains many of our best-known designers of country houses, and it has been apparently the purpose of the publishers to get the work of prominent architects.

As to the subjects of illustration in the book, there are many beautiful landscape and garden views shown, thus giving an idea of the setting of the houses as well as the houses themselves. The houses are built of all the usual materials, there being perhaps more stucco than any other particular type. The houses are expensive but not pretentious, and seem to be of the type suitable to large country estates where much attention is given to the grounds. One regrettable feature of the book, however, is the very small scale to which the plans have been reduced. Plans are among the most interesting features of a house, and are very often necessary to explain the photographs, and should, therefore, not be slighted in favor of photographic illustrations, however attractive these may be.

COUNTRY AND SUBURBAN HOUSES—Designed, Published and Copyrighted by Wm. Dewsnap, Architect, 1912. Paper, 9x12. Price, $2.00.

This book contains over fifty designs of houses ranging in cost from $5,000 to $25,000. A majority are illustrated from photographs of erected work. The houses are suitable for suburban and country construction and range in size from those of eight rooms to twelve and fourteen rooms. All modes of construction, stone, stucco and wood, are illustrated. The plans are well considered and well arranged. In the forepart of the work, there are a number of photographic and sketched details of interiors, which may offer suggestions to the home builder.

Art and Architecture

(*Continued from page* 21)

THE ANNUAL MEETING OF THE SOUTHERN PENNSYLVANIA CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

This meeting was held in Harrisburg on May 23, 1912. Mr. D. A. Dempwolf made an informal presidential address referring to the progress of the chapter, and the other officers made their reports. Resolutions were adopted on the death of Mr. C. A. McClure, who was a charter member of the chapter. The officers elected for the following year are as follows: President, J. A. Dempwolf; Vice-President, B. F Willis; Secretary, M. I. Kast; Treasurer, C. Emlen Urban; Directors, J. B. Hamme and Thomas H. Hamilton.

The chapter banquet was held on the following day, at which Mr. Glenn Brown, Mr. D. K. Boyd, Mr. John Hall Rankin and Mr. Frank C. Baldwin spoke.

THE FOURTH ANNUAL CONVENTION OF THE PENNSYLVANIA STATE ASSOCIATION OF ARCHITECTS.

At this convention, which was held Tuesday, April 9th, and of which the official report has just been distributed, President Boyd gave an address summarizing the activities of the Association since its formation four years ago. The Association has fathered many very important bills for the improvement of architecture and building construction in the State of Pennsylvania, and has been the means of knitting the architectural interests closely together in that State. A resolution was passed to hold the annual meeting every other year in Harrisburg while the Legislature is in session. In the alternate years the meetings will be held where it is deemed advisable by the Association. The officers elected for the following year are as follows: President, Edward Stotz, Pittsburg; Vice-President, Albert Kelsey, Philadelphia; Secretary, Richard Hooker, Pittsburg; Treasurer, Reinhardt Dempwolf, New York.

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FREIGHT ELEVATORS **CELLAR HOISTS**

Catalog and Prices Free **J. G. SPEIDEL, Reading, Pa.**

Industrial Progress

VITROLITE FOR A SANITARY KITCHEN.

On the opposite page we call your attention to a photograph of what we call a "Sanitary Kitchen." The floor is tiled and the walls are lined with a product known as "Vitrolite."

This product is absolutely impervi stains, as it has the composites of glas strength of mineral products. Chen tested it and shown that it is abso pervious to any acids excepting hydrofluc a little soap and water, this kitchen w cleaned as quickly and as perfectly as which is also shown in the photograph, which is also of "Vitrolite."

The "Vitrolite" is of a creamy w which will not change or vary. It teriorating with age, and does not cr particularly adaptable to structural wainscoting, closet partitions, door tri

Any information about "Vitrolite" tained from George A. O'Connor, w cated in the Fifth Avenue Building, Avenue, or from the Vitrolite Compan ersburg, West Virginia.

Elbert Hubbard, the sage of East Aurora, has compiled a list of the world's twenty greatest men about which he has built an essay.

Mr. Hubbard's essay is done into book form by the Roycrofters, and the title is "Joseph Dixon, One of the World Makers."

Mr. Hubbard refers to Joseph Dixon as "a man whose work has profoundly influenced civilization, yet strangely enough, a man of whom the world at large knows little."

This tribute to the founder of the Dixon Company is well worth reading, especially by those who wish to learn more of the character of this truly great genius or by those who admire Mr. Hubbard's vigorous pen.

Owing to a limited edition of this booklet, copies cannot be distributed except by request. The Joseph Dixon Crucible Company, Jersey City, N. J., will be pleased to honor such requests.

(*Continued on page* 42)

ELEVATOR SHAFT CONSTRUCTION

By H. ROBERT CULLMER

Assisted by ALBERT BAUER

Practical Suggestions for the Installation of Elevators in Buildings

A treatise for the architect and builder covering the surveying and preparing of detail drawings for elevator shafts; machine rooms; elevator bulkheads; tables and formulae for calculating the size and capacity of elevators; freight elevators; sidewalk elevators; dumb-waiters; specification writing for elevator installation; elevator shaft doors and appliances; building regulations covering elevator installation.

Cross Section of Elevator Shaft and Bulkhead.

Elevator shaft construction in buildings has never before been technically treated. This book supplies the demand for information on this subject, and it has been the effort of the author to supply the necessary data for the use of the architect in placing an elevator equipment in any building. New York practice is followed, and the Building Department laws and regulations of New York are made the standard. The author has also made a careful study of the regulations in use elsewhere, giving the deviations from New York requirements. Specification writing for elevator equipment has been covered by two forms; one a simple specification for a single elevator, the other a more elaborate equipment embracing several styles of cars suitable for an office building.

The book contains most practical information and it is the hope of the author that he has omitted no important point. Every phase of the shaft problem in building construction has been covered, and the method of presentation is such that ready reference is possible to any detail of the subject.

The book is in companion size with the **Building Construction and Superintendence** Series, by Mr. F. E. Kidder.

Cloth bound, 170 pages, Frontispiece, 47 diagrammatic plates, 15 illustrative plates

Price $3.00

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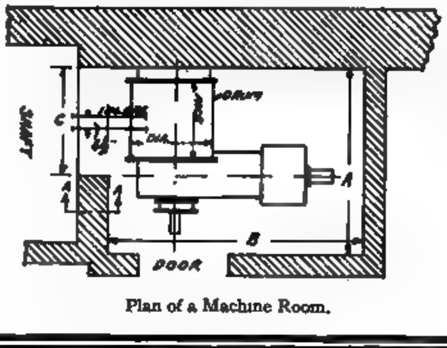
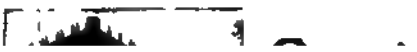


Plan of a Machine Room.



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Marshall J. Smith and Warren C. Powell have formed a partnership to conduct the practice of architecture, under the firm name of Marshall J. Smith & Warren C. Powell, architects, 567 Candler Bldg. Annex, Atlanta Ga. Catalogues and samples from the allied arts, sciences and trades are requested.

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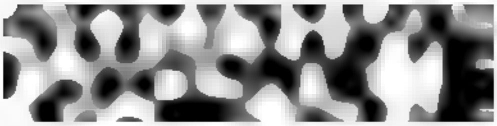
C. A. Amari, architect, announces that he has opened an office in Palatka, Florida, and wishes to receive manufacturers' catalogues and samples.



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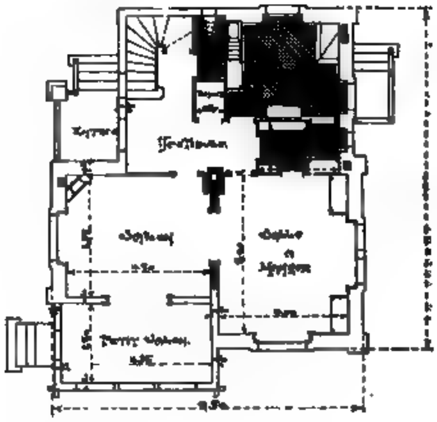

IN the series of articles which have appeared in ARCHITECTURE AND BUILDING, Mr. W. S. B. Dana has given an epitome of his researches on Châlet Architecture. In this book, which will be issued shortly, the subject is much elaborated, and both the volume of text and number of illustrations are doubled. There are ten valuable chapters in this new book, one of which treats of the châlet as adapted to American uses. This chapter is well illustrated.

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ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. JULY, 1912 *NUMBER 7*

CITY HALL PARK

By J. L.

I WONDER if the saying that the prophet is not without honor except in his own country is not being exemplified these days in the case of the little park which lies between Broadway, Park Row and Chambers Street in the city of New York.

Here are sights to cause the citizen, male or female (I believe in Women's Rights), to pause in the mad rush for gold and contemplate the works that men are doing. And how few of them do pause; how few of the thousands ever give it a thought. But it isn't the mad rush for dollars nor even, calling it by its right name, the fierce struggle for existence—no, it's sheer indifference that keeps folks moving as they pass in thousands upon thousands, swarming upon the bridge, pouring in streams into the subway and out of it, dodging the trolley cars, blocking the horse cars,—for the horse car is still seen in all its ancient panoply in this most modern spot in the whole world.

As I cross this park from time to time I wonder why the crowd doesn't stop for a minute and gaze on the wonders that are to be seen, for instance, in the two monster buildings now being finished there.

Possibly the police might take a hand and make them move on, and well they should, for the park is none too large. Fortunately for me, when I am gazing in awe at the sights there's no one to make me move on. So long as I "mind my eye" and keep from being run over I can rubber to my heart's content.

Two monster buildings, two of those skyscrapers that narrow-minded reactionaries would have laws to prevent. Two kinds—so different that one is almost surprised to see them there so near one another, one tall and Gothic, like a great Sequoia, the other widespread and American, like a mighty oak—two different species in the same soil and therefore perfectly proper and natural. The Woolworth building, higher by two hundred odd feet than the Cologne Cathedral, which was for ages (wasn't it ages?) the tallest building in the world and took centuries to build, looks down on you in awesome grandeur. Yes, it *is* grandeur and it *is* awesome.

even though the evidence is so plain that it's a shell enclosing a myriad of cells or rooms in which the little tiny men who built the great thing will carry on their affairs, in other words "do business."

And the Municipal Building, seemingly growing to be the worthy house of the great city. What luck for Americans that the job of being architect of this building should have fallen into hands that could do it so well. I say Americans advisedly for New York belongs to America, to the whole country. Washington is the Capital, but New York is the Metropolis, and the work of unifying this great nation is helped, nay, made possible by such a thing as this magnificent town.

Soon the skeletons of these two structures will be covered, the moving picture show of building will end and the presentment, as far as they are concerned, will become quiescent. Then will come other shows. No doubt the Divinity that shapes the city's ends will cause the removal of the court houses and the Federal Building which now crowd and deface the park, and the landscape setting of the precious little City Hall, monument of early promise, can and will be improved as it should be.

More work for the undertaker, as they say in Princeton; more tearing down and more building up. New York has a chance of being finished in the far distant future, maybe, but, finished or unfinished, the City Hall Park is a delight forever.

FAILURES IN BUILDING CONSTRUCTION AND THEIR LESSONS

ARTICLE I.

BY EDWARD GODFREY, M. Am. Soc. C. E.

IT is the writer's plan to include in this series the five following articles:

(1) Foundations, Walls and Piers.
(2) Columns.
(3) Beams and Slabs.
(4) Bracing.
(5) Materials, Processes and Details.

It is his aim to gather from the facts of wrecks and partial failures the lessons that are most useful to the structural designer and the architect.

There are two principal ways in which lessons concerning structures are learned; these are by analysis and synthesis—the taking of things apart and the putting of things together. And there are two ways in which analysis and synthesis are exhibited; these are mental and physical. The mental has its expression on paper and in books, the discussions and plans of authors and designers, the physical has its expression in brick and stone and wood and steel and concrete.

The author takes apart the components of a piece of construction and discusses the needed size for the work these several parts have to perform. The designer puts together these several parts and on paper constructs a building. Here we have mental analysis and synthesis, and the lessons that can be learned from these are limited. Too often this limit is not appreciated, and when the builder performs the physical synthesis, nature comes in with her inexorable laws and proceeds to do a little analytic work.

It is the lessons that can be drawn from this fruitful but neglected field that will be emphasized in this series of articles. A large number of lessons can be learned from just this source, lessons that in many cases reverse the teachings of standard text books. They are not lessons that discredit theory but that show the blindness of some theorizers.

When a wreck occurs there is usually an alleged investigation. The average investigation is the last place in the world to look for the real cause of the wreck, unless one can read between the lines and discover by what is suppressed the real nature of the weakness. There is always a lawyer present and someone's interests to look after and accommodating "experts" are never hard to find; also imperfections in workmanship or materials can be detected in any job that was ever done.

It can be set down as a general rule, with scarcely an exception, that when there is a wreck of any large extent, there can be found enough faults in the design to make a wreck the most natural thing to look for. The writer is a designer himself and makes this statement most deliberately and emphatically. In his experience of more than twenty years of designing and checking designs he has found a surprising number of errors—dangerous errors—in the standard methods of designing. He has made a special study of wrecks and failures and has repeatedly put forth the proposition that, excepting minor failures, *wrecks do not occur because of imperfections in workmanship or materials, but they do occur because of improper design.*

These errors in design are not merely miscalculations, assumptions of too high unit stresses and pressures (within small limits); they are neglect of great over-

shadowing principles of engineering. And again, addition of material does not necessarily mean additional strength; large increase of strength can often be effected by mere rearrangement of the same amount of material.

A steel truss does not fall down because a designer used 18,000 lbs. in place of 16,000 lbs. per sq. in. in his steel. A roof does not collapse because the computer neglected to count in the weight of the sheathing. A floor will not go down because the architect omitted to include the weight of the cinder fill. All of these things tend to weakness and lack of rigidity in a structure: they might show up in excessive deflection, cracked ceilings, etc., but the causes of extensive wrecks are deeper seated than this.

A column will not sink and wreck the building of which it is a part, if the architect assumes a safe pressure on the soil of 2¾ tons in place of 2¼ tons per sq. ft., if the design of the building is otherwise correct.

The burden of this series of articles will be that a designer has no right to put forth a set of plans for a structure, that do not show a proper factor of safety in every part, and then blame the contractor when wreck results. Emphasis is not lacking in literature, and properly so, of the importance of good materials and workmanship, but emphasis is sadly lacking of the still greater importance of proper design.

Foundations, Walls, and Piers.

A frequent cause of failure in foundations is the lateral flowing of the soil beneath a footing. This may be the result of footings being an insufficient depth below the surface, or it may result from excavation in the neighborhood of a building. The walls of the Homeopathic Hospital in Pittsburgh (see Engineering News, June 11, 1908) sank because of three reasons. First, the pressure on the soil was too great; second, the footings extended but a short depth below the cellar floor; third, the clay soil on which the footings rested was allowed to be water-soaked and thus its bearing power greatly diminished. The moisture in the clay aided very materially in allowing lateral flow.

The lateral flowing of quicksand is especially to be guarded against. Retaining walls and embankments sometimes cave in with great destructive force by reason of dredging operations many feet away. The quicksand flows in as it is dredged out, the foundation is undermined, and finally a cave-in results. When a dredged hole continues to fill up in this manner, operations should be suspended, if there are any structures or embankments near. Some buildings in Chicago sank because of excavation for the freight tunnels in the neighborhood of their foundations.

One means of preventing the flow of soil when neighboring excavation jeopardizes the foundation of a building is to drive sheet piling around the footings to be protected.

In design the base of a footing should be several feet below the ground level or the cellar-floor level, particularly when heavy pressures are to be provided for and when such soils as clay are met with. Lateral flow of the soil can take place more readily when the pressure is exerted near the surface than when it is in the bottom of a ditch several feet deep.

Partial failure is sometimes exhibited in buildings by cracking of walls or plastering. This may be due to unequal settlement in walls and columns. Usually some settlement is to be expected in a building. This need not occasion any concern, if the settlement is uniform. In order that the settlement be uniform it is necessary to design the footings so that the area in contact with the soil will be in proportion to the load carried, provided the soil is of equal bearing power

FIGURE 1.

over the entire foundation. If soft spots are found in making the excavation, the footings should be increased in area accordingly, or piles should be driven in, or the soil should be compacted by some means.

Monolithic concrete walls are greatly superior to rubble walls in that they induce equal settlement of a foundation by distributing the pressure.

In a system where piles are used the full load should generally be counted upon as resting on the piles alone. This is particularly true where the piles are driven to a firm bearing and where the soil is yielding.

In one large building a column which was originally intended to carry a comparatively small load was, by a change in the plans, compelled to take a very heavy load. The piles had been driven, and this column had but one concrete pile under it. A large spread footing was placed on the head of this single pile, and this rested on filled ground. A spread footing on yielding soil is expected to settle somewhat before it can carry its full load; a concrete pile driven down to solid bearing is not expected to settle to any appreciable extent. It is evident, then, that the combination is a poor one: the spread footing but adds burden to the already heavily overburdened pile. This column should have had six or seven piles under it. The thing that should have been anticipated took place in this building. The column settled more than an inch and in fact set off the highly overstressed structure, a large portion of which collapsed.

A frequent cause of failures in rubble and brick walls and piers supporting columns is the absence of spreaders for the concentrated load of the columns.

A building in Pittsburgh collapsed because the first story division wall had been removed and the columns supporting the upper stories in the place of this wall were placed on the rubble cellar wall without spreading beams. The investigators, of course, attributed the failure to "poor foundations," though attention was specifically called to this structural blunder. The foundation was not shown to have settled a particle; these columns, however, were seen to be jammed into the wall.

Another building in Pittsburgh showed

FIGURE 2.

incipient failure by cracking of the basement wall. The steel columns of this building, a good sized office building, had been started at the first floor level without spreading beams on the basement walls. Of course, they should have run down to the basement floor and should have had individual foundations. Steel columns had to be substituted in the basement story after the building was practically complete.

The cast-iron bases in a number of columns in a brewery building in St. Marys, Pa., cracked because they were laid on rubble piers and failed to receive a uniform bearing. Spreading beams or concrete piers would have prevented this failure.

In Engineering Record, Dec. 17, 1898, there is a description of some building columns which crushed into brick piers because the load was not properly spread over the surface of the pier. It is manifest that a brick pier should not be loaded with a heavy concentrated load, without ample provision for spreading the load over sufficient surface to reduce the pressure to safe limits.

In Engineering News, Oct. 19, 1911, p. 489, there is a description of a building failure that occurred in Boston. A column supporting 40 tons crushed into a brick and rubble pier which was intended to support it. The large stones of the rubble portion of the pier were placed on the outside for appearance, and the middle part, where the strength was needed, was filled with small stones.

A high basement wall in a long building in Pittsburgh caved in laterally because of fill that had been placed against it. The wall was a substantial concrete wall, but was not suitable to act as a retaining wall to sustain the pressure of the earth fill against it. The first floor beams had not been placed. This would have helped it materially. In addition to this there were cross walls to be built, and these had not been built. The fill was removed, and the wall was jacked back into place and the building completed without further trouble, after the cross walls had been built.

Several instances have come to the writer's notice where veneer on walls or piers has failed.

In one case a brick wall had a cast stone veneer 4 inches thick. This cracked and spalled in a way that showed that it was heavily loaded. In another case a concrete column or pier had a cast stone veneer. In another case a rubble stone wall had a cut stone veneer. In another case a brick wall had a terra cotta veneer.

The cause of these failures is a simple one to explain. The main wall or column or pier, which is or should be designed to carry the full load, shrinks in setting; this throws the load on the veneer, and failure results. The reason the veneer and the backing do not shrink in the same amounts is because the veneer is in high blocks with thin mortar joints, whereas the brick or rubble wall has many more joints and much more mortar in its make-up. Concrete and mortar both shrink in setting.

There are several ways of overcoming the difficulty. A course of veneer blocks may be left out (wooden blocks being temporarily used) and subsequently inserted when the wall has set. Or the mortar may be all raked out of some of the joints and these pointed after the wall has set.

Hard, glassy brick used for veneer sometimes crack from the effect of temperature changes, especially when laid in strong cement mortar. The remedy is to use a lime and cement mortar.

A frequent cause of failure or disfigurement in walls is excessive thrust of arches. The arch is one of the most useful as well as one of the most abused forms of construction. One of the essential parts of an arch is the abutment,

and an arch that has no abutment or an insufficient abutment is seriously weak. An arch that is supported by two slender piers or posts violates not only the principles of good engineering, but also violates the sense of proper architectural proportions, because it gives the idea of instability. The flatter the arch, that is, the wider the span in proportion to the rise, the greater the thrust. Hence flat arches are specially apt to force out a wall and open up the joints at the crown of the arch. When the opening in a wall occurs close to the corner of the wall, leaving only a narrow pier, there is not sufficient abutment to take the thrust of an arch over this opening.

The accompanying photographs show examples of arches of this sort. Fig. 1 is given because the arch in this case has actually failed. It is cracked and the pier is pushed out. Figs. 2 and 3 are given because they are in dwellings of considerable architectural pretentions. These flat arches on posts violate the principles of good construction.

There are two ways to remedy this class of failure or disfigurement. One is to use a horizontal lintel over the opening in place of an arch: this gives a better appearance than an arch without sufficient abutment, and does not violate the principles of stability. The other remedy is to embed a horizontal beam or girder in the wall, at or above the crown of the arch, allowing the arch to take only its own weight and relieving it of the burden of the superimposed weight of wall.

Lintels in walls are usually designed by a sort of rule-of-thumb method that considers only a certain triangle of weight of wall as resting upon the lintel regardless of the details of the wall. This may lead to erroneous construction and sagging lintels. If a wall above a lintel spanning a wide opening is pierced by openings so that a pier is located over this lintel, the load of this pier, and consequently much more than a small triangle of wall, must be carried by the lintel.

In one building a floor girder rested in a wall a short distance above a lintel. The lintel was not designed to carry this load. Failure could readily result from lack of care in this particular.

FIGURE 3.

STUDENTS' WORKING DRAWINGS

Cornell University, College of Architecture

IT is readily admitted—if not demanded—that the education of the architect of today should be something more than mere training in the technique and details of the profession. The architect must be a man of broad interests and liberal culture as well as technical training; and four years in a university, even the modern American university with all its push and hard work, is entirely too little time to give even to the ablest of men the complete training requisite. For that reason the school of architecture must leave undone many of the things that should be done, and must lay particular stress upon the things that are broader, larger and more fundamental than mere details. Nevertheless, we could hardly hope to develop the real architect without giving at least some attention to the commonplace details of his profession even in the preliminary stages of his education. The history, science and esthetics of architecture are then the things with which we concern ourselves first of all, the details entering as incidental facts, though in the end essential. With this training as a foundation the young man is in a position to develop in a wholesome way after leaving the university.

It is quite true that too great insistence upon technical details in the early stages of the student's growth is a pedagogical error, likely to lead to confusion, lack of understanding, consequent lack of careful elaboration and lack of seriousness because of the lack of definite responsibility. The student can and must learn details in an office later, and will learn them there more quickly and more effectively because he is on real work and his mistakes mean much more than a slight reduction in his term's mark or an admonition to be more careful next time. However, we have not gone to the extreme with some of our contemporaries, who hold that the teaching of details has no place at all in the college curriculum. We believe it has a place and a definite place, even though it be a minor one; hence the course in working drawings herein illustrated.

This course is given in the first half of the third year after the student has some perception of architecture and sufficient technical knowledge to appreciate its meaning, and because its introduction here tends to secure a reasonable application of practical details in the later courses in design.

Preparatory to the course in "Working Drawings," the student has already had a considerable training in archaeology, elementary design and freehand drawing in addition to his general historical and scientific studies. In particular, as more directly bearing on this work, he has had a brief course in the planning of small buildings, including a series of residential problems. The more advanced work in the planning of monumental buildings comes later. The course in "Working Drawings" varies from year to year, but as herein illustrated it consisted of a preliminary sketch of a small house (really a sketch problem in design) following a written program as in the regular work in design. The sketches were required at a scale of ⅛ inch to the foot, and from these were developed the ¼ inch scale working drawings as shown. The fin-

First Floor Plan

Foundation and Basement Plan.

A RESIDENCE FOR MR. C. D. KRUSE, DAVENPORT, IOWA.

Walter O. Kruse, Architect.

Third Floor Plan.

Second Floor Plan.

A RESIDENCE FOR MR. C. D. KRUSE.

East Elevation.
A RESIDENCE FOR MR. C. D. KRUSE.

ished drawings required were cloth tracings of all floor plans, all elevations and at least one section. In addition to this, certain periods were set aside for the making of full size typical details such as windows, doors, cornices, etc. These details were made in pencil only and used for reference in developing the ¼-inch scale drawings, the result being that although no full size details were developed as finished drawings many details were studied in their application to the problem, the purpose being to give the student himself a maximum of profit in the understanding of his work.

Not the least interesting thing about this course in "Working Drawings" is the comparatively small amount of time given to it. Figured out on a strictly pro rata basis with other courses given at the same time we find that the pupil is allowed two days for his preliminary sketches and twenty-five and one-half days for making and finishing the ¼-inch scale working drawings and pencil studies of typical details, or slightly less than four weeks of office time for the entire work. Whether the results are adequate or otherwise must be for the reader to judge, bearing in mind that the pupil has designed his own house from a written program without other definite suggestion, and usually without previous experience in this line of work.

In subsequent issues other examples of the work in the course in "Working Drawings" at the Cornell University College of Architecture will be presented. The designs chosen are the work of several students.

South Elevation.

Sections and Details
A RESIDENCE FOR MR. C. D. KRUSE.

DANIEL HUDSON BURNHAM

By THEODORE STARRETT

I FIRST saw Daniel Burnham when he was in the flush of his early business success in 1884. He had just started to get his gait. With his partner, John W. Root, and a great lieutenant, Frank Sickels, and a water color genius, Paul Lautrup, to make perspective drawings, he had formed a combination that was sweeping everything before it, as the crop of commissions proved. The Montauk Block, the first of the skyscrapers, a little fellow about eighty feet square and nine stories high, was under construction, and The Rookery, Phenix Building and Insurance Exchange were on the boards. I was office boy and student at the time for W. W. Boyington, who had been, and still was, Chicago's greatest architect of the old régime. I was a bashful youngster carrying a letter from my employer to the "future great." I handed it to him in person as he sat in his little private office hardly big enough to hold his desk and himself. Burnham was a great believer in the small private office. His planning faculty and his economical instinct showed even in those days in the way in which he would lay out an office to hold a roll top desk and three chairs—one for the office holder, one for the visitor and one for a stenographer, with a chance for two visitors if the stenographer would vacate. The Grannis Block was one of Burnham & Root's buildings then recently finished, and their office was laid out well and properly. Everything was done right. There was an outer office, but the guardian, if there was one, was off duty, so I wandered into the presence of the great man without any formality. I remember him as he sat at his desk—a large man, not so well shaped as he grew to be in his later life, reddish brown hair and a big drooping red moustache, a wide-opening eye that swept me with its glance as he held the letter in his hand. I was detained a moment to see if there was an answer and then dismissed.

The next time I saw him was a year later in Burnham & Root's offices in the Montauk Block, where growing business and the need for expansion had carried them. I was hiring out to the firm on a month's trial, the pay to be what I was worth. I had been ushered into Sickels' office, where Burnham was standing. I noticed then his erect and commanding figure,—that front and poise of Jove himself,—for Burnham was one of the grandest looking men that ever lived, and much of his success was due to his presence. I will spare an account of what he said, although I remember every word and every gesture as he turned me over to Sickels, foreman of the office and at that time forming with Burnham and Root one of the architectural Big Three in the city of Chicago. The job with Burnham & Root lasted for six years, or until I left to go into business for myself. During those six years I saw and was a small part of many interesting things.

Those were the days and that was the place of the beginnings of steel skeleton construction—not the origination of it, because it grew in many offices. Mr. Jenney, for instance, who had been Burnham and Root's employer and preceptor, had a large practice, though even then it was overshadowed by the work of the younger firm. Mr. Jenney was an engineer-architect and as such approached his work from the engineering point of

view; Root was an artist draftsman; Burnham just a plain business man. As Burnham's was the dominant nature, the new firm was doing business in a business way, though with great ambition and great pretensions as to what I will call pure architecture namely, the beautification of the outward skin of the building. The business of the firm grew apace. They won the Stock Exchange competition in Kansas City, having as competitors some of the best architects of the East. A whole swarm of commissions came into the office, and before The Rookery was finished the Kansas City Stock Exchange, the Midland Hotel in Kansas City and two other large buildings there, together with more business in Chicago, made it necessary for them to move to larger quarters. These were established in The Rookery, where again a suite of offices was laid out according to the favorite plan—a large office for consultations, an enormous drafting room, with tiny private offices for the members of the firm.

The untimely death of John Root was a great blow to Burnham, for he had fairly idolized him. Part of the success of the firm was due to the abiding admiration that Burnham felt for his partner. When he would go after business he would brag about Root as an architectural genius in a way that was wonderful to behold. It was a case of David and Jonathan over again. Whether Root's genius was as great as Burnham thought it in those days I used to doubt, but in the light of present knowledge comparing his work with that of his contemporaries, it is a question in my mind whether he was not as great an architect as Louis Sullivan and whether he might not, if he had lived to round out his years as his partner did, have done as great things in his way as did Burnham.

An incident which happened in the early days in The Rookery is interesting. A disaster occurred on the Midland Hotel in Kansas City as it was being topped out. Several of the trusses supporting the roof of the dining room, which was at the top of the building, had crushed their supporting piers and had fallen to the floor below, causing the death of one or two men. The news came to the office that the building had fallen down. It looked as if the end had come. Burnham went into Root's office and threw his arm around him and said, "John, we have stuck together in prosperity, we will stick together in failure." But it was not to be failure. Later reports came which showed that the disaster was not as great as had been supposed. Burnham rushed to Kansas City, and the way he pulled his firm out of that scrape in the succeeding days was not the least of the magnificent things of his career.

The World's Fair and the untimely death of Root, incompatible as the two things may seem had well nigh ended the professional career of Burnham, at least so his enemies thought. I am not sure whether the loss of Root had anything to do with the employment of the eastern architects on the important buildings of the Fair or not. I am under the impression that the general scheme had been laid out and that the parceling out of the great buildings to Richard M. Hunt, McKim, Mead & White, Peabody & Stearns, George B. Post and others was decided upon with Root's concurrence. When Root died Burnham threw himself into the work of the Fair and allowed his private practice to go to pieces. He had an eye to the future even then.

"O, days and nights, your work is this,
To keep me from my proper place;
A little while from his embrace
For fuller gain of after bliss."

Through all the work of the World's

Fair the great offices in The Rookery were kept up, although sometimes there were not a corporal's guard in the whole establishment. After the Fair was all over and the work of removing the old buildings had been finished, Burnham returned to his old place. The little private office was not used very much. The big reception room was Burnham's office. Standing in front of the fireplace overlooking him as he worked stood a bronze bust, life size, of John Root, which had been made by Johannes Gelert. There it stood watching the surviving partner as he took up the white man's burden and moved on to affairs that completely eclipsed those of the old days.

When increasing business again compelled the removal to larger quarters in the Railway Exchange Building, Burnham's office was built again in the southeast corner of the building, larger, much larger, than the big reception room in The Rookery; simple in its design, preserving the warm brown colors of the old room, only larger; the rug, specially woven, was of the same fabric as the old rug, only larger; and the table which occupied the center of the room was big enough to spread upon it the enormous drawings of the Lake Front Improvement, one of Burnham's occupations during the old idle days of the interim. The same uncovered desk which had stood in the reception room in The Rookery and which Burnham had used after he had left the small office, stood at one end of the new office, and overlooking him as he worked stood the bust of his beloved partner.

The last time I saw Burnham was three years ago. As I entered his office he was standing silhouetted against the bright light of the windows. His imposing height and his magnificent carriage were again impressed upon me. My first words were, "How are you, Mr. Burnham?" and his reply that he was getting old seemed to belie his looks. He was then only sixty-three.

It is hard for me to think of Burnham without thinking of Root. Root died in 1891; Burnham's death on June 1, 1912, at the age of sixty-five was untimely even as had been his partner's.

TREPIED ETRUSQUE EN BRONZE

THE PUBLIC LIBRARY, ST. LOUIS, MO.
Cass Gilbert, Architect.

PUBLIC LIBRARY BUILDINGS

SOME comparisons are illuminating. The central library of a great American city is the head of a system. The building that houses it, it may be said, takes on a certain definite form. The library system suitable for a large population consists of one central building with branch buildings distributed over the territory which make the literature readily accessible to the people. If we compare the plan of the St. Louis library with that of the New York public library we will find that the difference is mainly one of size and that the elementary principle of each plan is about the same. The greatest difference to be noted is in the working of the library. In New York the catalogue room and main reading room are at the top of the building; in St. Louis the delivery room and reference reading room are on the first floor. But, all things considered, the principle of the planning is the same in the two buildings. Both plans contain a central pavilion with courts to either side. This pavilion in a sense ties the whole building together both in its plan and in its operation.

In the St. Louis library there is a monumental approach with a vestibule, entrance hall and stair hall, the flights leading to the upper story being to either side. There is a direct passage through from the front entrance into the delivery and catalogue room which forms the central pavilion of the first floor. Left and right from this delivery room are the reference reading room and the open shelf room. To the rear of the delivery room, passing through a small wing which contains working quarters, is the main stack room which occupies the rear of the building. The left and right wings at the front contain the art col-

ST. LOUIS PUBLIC LIBRARY TWO READING ROOMS.

General Contractor: John Peirce Co.
Painting: W. P. Nelson Company
Clock System: Seth Thomas Clock Co.
Grant Overhead Pulleys Used.

Cass Gilbert, Architect.

ST. LOUIS PUBLIC LIBRARY. ENTRANCE HALL AND DELIVERY ROOM DETAILS.

Cass Gilbert, Architect.

The Gorham C- - - -
Glass Mosaic (
Painting: W
Carved Stone
Clock System:

en.
Rlcol.

ST. LOUIS PUBLIC LIBRARY. CORNER PAVILION AND VESTIBULE.

Glass Mosaic Ceiling: Heinigke & Bowen.
Carved Stone and Models: Donnelly & Ricci.
The Gorham Co.: Bronze.
Chicago Triplex Butts Used.
Evans' Crescent Expansion Bolts Used.

Cass Gilbert, Architect.

The Gorham Co.: Bronze. ST. LOUIS PUBLIC LIBRARY. BRONZE GATES AND DOORS. Cass Gilbert, Architect.

FREE PUBLIC LIBRARY, NEW HAVEN, CONN.

Engineers: Samuel M. Green Co. Cass Gilbert, Architect.

lection room and the periodical room, both entered from the main entrance hall and connecting through into the two side wings. Thus all the principal rooms are interconnected and there are no corridors, entrance to the reading rooms being obtained through the main entrance and delivery room.

The second floor of the St. Louis library is divided into smaller special libraries and the business departments of the library. The court surrounds three sides of the central pavilion at this level.

The St. Louis library cost about one and one-half millions of dollars. It is a monumental building, as it should be, and it has appropriate mass and proportion. In the detail of its interior it has a wealth of beautiful and well-designed architectural adornment. Doorways, mouldings, cornices, appropriate bronze gates and doors, ornamental lamps and decorated ceilings are all well thought out and perform their part in the decorative scheme of the whole.

The City Library of Springfield presents in another form a plan which on a smaller scale accomplishes the same purpose as the St. Louis library. There is the main entrance and stair hall in one, opening directly into the combined delivery and catalogue room. One stack is behind this and in the basement is the principal stack space. To the left of the delivery room is the main book room, which combines a reference reading room and an open shelf room in one. To the right of the delivery room is the fine arts room, and the periodical room occupies a space just to the right of the entrance on the front. The second story contains small rooms devoted to various libraries. Two open wells which illuminate the main book room and the fine arts room pass through this story.

NEW HAVEN FREE LIBRARY. THE ENTRANCE.

Sebco Expansion Bolts Used. Cass Gilbert, Architect.
Otis Elevators.

Newman Watch Clock System.

NEW HAVEN FREE LIBRARY. A READING ROOM AND DOORWAY.

Cass Gilbert, Architect.

The architect of the St. Louis Public Library was Cass Gilbert. The John Pierce Co. were the general contractors. Donnelly and Ricci did the stone carving and produced the models for all the carved work and relief ornamentation. The exterior is of white Vermont marble. The W. P. Nelson Co. did the painting and Heinigke and Bowen produced the mosaic glass ceilings of the vestibule and halls. The bronze entrance gates, bronze doors and screens were cast by The Gorham Co. The clock system of the building was installed by the Seth Thomas Clock Co.

In the Springfield Library, the Cheney Bigelow Wire Works erected the elevator enclosures. Cass Gilbert was the architect and the Samuel M. Green Co. were the engineers in charge of construction.

SPRINGFIELD CITY LIBRARY. THE DELIVERY DESK.
Edward L. Tilton, Architect.

CITY LIBRARY BUILDING, SPRINGFIELD, MASS. PERSPECTIVE AND PHOTOGRAPH.
Otis Elevators.
Corbin Hardware.
Edward L. Tilton, Architect.

SPRINGFIELD CITY LIBRARY. TWO READING ROOMS.
Elevator Enclosure Erected by Cheney Bigelow Wire Works. Edward L. Tilton, Architect.
Grant Overhead Pulleys Used.

ESSEX COUNTY NATIONAL BANK

NEWARK, N. J.

CLINTON & RUSSELL, Architects

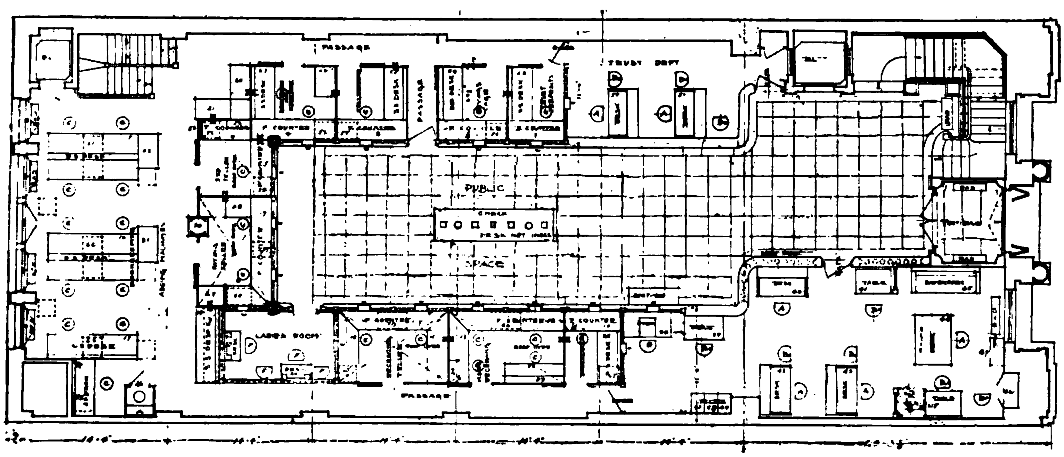
PLACED just beside the Public Service Building, which was finished about a year ago, and which forms part of the Prudential group on Broad Street, Newark, the Essex County National Bank is a building with a three-story façade built up of white marble with a great bronze screen sixty feet in height which contains all the window area of the front. The portal is also of marble and frames the bronze entrance doors.

Within, the floors and counters are of marble, the screens above the counters of bronze, the sidewalls of Caen stone and the ceiling of ornamental design in white plaster. The marble of the flooring is Tennessee and the marble for the counter bases is Bottocino. Besides the windows at the rear, there is a series of square ceiling lights which furnish an even illumination for the interior.

The bank directors originally contemplated a fifteen-story building and had in view a much wider plot. However, the problem finally presented was to place a banking equipment on a plot some 39 feet in width, and this was the problem which was worked out by Clinton and Russell, architects, and Thomas Bruce Boyd, the bank engineer. The primary scheme was a one-sided bank with a front entrance to one side, but Mr. Boyd developed the horse-shoe plan with a center door. This gave good accommodation for present needs and sufficient room for expansion. The bank is planned on a unit principle and is well schemed for the efficient conduct of a banking business in the future.

In arrangement the central space is for public use, while the banking area is arranged about the walls with the office of the president immediately at the side of the entrance vestibule in front. One side is practically not used at present and provides for future expansion. The rear mezzanine furnishes a commodious space for the working force, and on the mezzanine at the front space is afforded for the directors' room, which has a balcony overlooking the interior.

The second floor occupies the whole lot area except for a central well above the skylight of the main banking room. It is reached by stairs and elevators both front and rear. This space is in-



FIRST FLOOR PLAN, ESSEX COUNTY NATIONAL BANK.

Thomas Bruce Boyd, Equipment Specialist. Clinton & Russell, Architects.

ESSEX COUNTY NATIONAL BANK, 753 BROAD ST., NEWARK, N. J.

Builders: The Hedden Construction Co. Clinton & Russell, Architects.
Gorton Wrought Steel Boilers
Bronze Façade and Doors: John Polachek Bronze & Iron Co.
Bank Vault Engineer: Frederick S. Holmes.

MARBLE FLOOR AND COUNTERS, BRONZE COUNTER SCREENS. ESSEX COUNTY NATIONAL BANK.

Grant Overhead Pulleys.
Lighting Fixtures: The Browe Co.
Sebco Expansion Bolts Used.
Interior Bronze: John Polachek Bronze & Iron Co.
Chicago Spring Butts Used.

Clinton & Russell, Architects.
Equipment and Furniture Designed By Thomas Bruce Boyd.

COUNTER DETAIL AND VIEW TOWARD THE ENTRANCE. ESSEX COUNTY NATIONAL BANK.

Lighting Fixtures: The Browe Co.
Evans' Crescent Expansion Bolts Used.
Interior Bronze: John Polachek Bronze & Iron Co.
Corbin Hardware.
Interior Marble: George Brown & Co.

Clinton & Russell, Architects.

Equipment and Furniture Designed By Thomas Bruce Boyd.

tended for the working force of the bank.

In the basement there is a safe deposit vault of which Mr. Frederick S. Holmes is the engineer. It is so built and illuminated that the watchman on guard can inspect all sides and the bottom by means of mirrors.

The Hedden Construction Co. were the general contractors. The interior marble work was done by George Brown & Co., and the ornamental plaster ceiling was carried out by Dominic A. Walsh. The screens for the banking room and the grills and rails for the elevator front and balconies are of bronze cast by the John Polachek Bronze and Iron Co. This firm also produced the bronze window frame work of the exterior. The Browe Co. made the lighting fixtures. Besides being instrumental in the planning of the bank, Mr. Boyd also designed the furniture and banking equipment.

The heating plant consists of two Gorton wrought steel boilers set in twin connection so that they can be run separately or together. Each boiler has a capacity for heating 3,950 square feet of direct radiating surface.

STANDPIPE AND HOSE SYSTEM IN BUILDINGS

Being Portions of the Report of the Committee on Standards of the National Fire Protection Association.

W. C. ROBINSON, Chairman

MR. ROBINSON'S report is valuable in that it presents a concise statement of the requirements of stand-

nents. The matter

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HOSE SYSTEMS

Standards has giv-

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be made to serve as components of each other.

At the outset the preparation of a standard for standpipes was found to be much more complex and difficult than anticipated. The subject is somewhat complicated by the great difference in municipal requirements, and in the opinions relative to the value of standpipe and hose systems as a means of fire extinguishment, but the existing requirements are usually so general in character that a comprehensive standard can probably be made to include all of their good features.

The Committee has confined its efforts to the consideration of inside standpipe and hose systems in which the water pressures can be maintained at all times. Standpipes for installation on the exterior of buildings and standpipes subject to freezing and in which the water cannot be maintained will also require careful consideration. As a result of the investigations made, the subject has been divided into the subdivisions indicated by the general headings in this report. An attempt has been made to include under each division all of the more essential features which require special consideration, particularly those relating to installation, use and maintenance. No attempt has thus far been made to formulate definite requirements or specifications, but it is hoped that the various items have been

presented in such a way that full discussion will be brought out and a good start secured toward requirements which will meet approval in all sections of the country.

GENERAL INFORMATION.

PREPARATION OF BUILDINGS.—Little preparation is necessary for the installation of standpipe and hose systems under ordinary conditions. The fixed part of the system can usually be conveniently located, and, by reason of the flexibility provided by the hose, without seriously affecting the protection furnished.

In buildings elaborately finished on the interior, where concealed piping is desired, special preparation for the installation of the standpipes in walls and partitions is often necessary. Closets or cabinets are sometimes desirable for the hose equipment, to render it less conspicuous and objectionable from the æsthetic point of view. Such closets or cabinets should be so designed as not to interfere with the handling of the hose and should be provided with signs calling attention to the fact that they contain the fire hose. Fire extinguishers and extra equipment, in the form of axes, crowbars and lanterns, can also be placed in such enclosures. Watchmen's stations and fire alarm boxes may be located to advantage in such closets or cabinets in some cases.

Ventilated metal clad hose houses on roofs are necessary where roof hydrants are provided and where the hydrant cannot be conveniently placed in existing enclosures on roofs. Special provision must often be made in the walls of buildings at the first story for the accommodation of the connections for the city steamers.

PLANS AND SPECIFICATIONS.—Detailed plans showing the location, sizes and connections of the fixed portion of standpipe systems should be provided, particularly where the building or plant is large and where numerous partitions or obstructions must be taken into consideration in the layout. These drawings should be drawn to scale and should consist of such floor plans and sections as may be necessary to clearly indicate all of the apparatus to be installed and its location. The plans should be accompanied by specifications covering the character of the material, and features relating to the installation in detail.

EXPERIENCED WORKMEN.—Standpipe systems should be entrusted to none but fully experienced and responsible workmen. Their installation should not be made incidental to other contracts of a similar nature unless full detailed specifications are employed in which the apparatus and materials to be used and the character of the installation work required is made clear.

SIZE OF STANDPIPES AND CONNECTIONS.

The size of the standpipes and connections is governed by the size and number of effective fire streams it is necessary to economically provide at any point or number of points in the building simultaneously. In other words, the size of the piping is dependent on the maximum quantity of water it is necessary to deliver at any point in the building in a given interval of time without introducing excessive losses by friction or placing an undue burden on the pumping apparatus.

After the size and location of the fire streams necessary for the proper protection of the building, both on the inside and on the exterior, and the number of these streams which it will be necessary to operate simultaneously have been ascertained, the size of the standpipes and connections necessary to supply them can be accurately determined, as the amount of water discharged by standard streams and the friction losses in hose and piping at various rates of flow is known and the problem is one in hydraulics.

In well-designed buildings where fire cannot readily communicate from story to story and where exterior streams are unnecessary, one standard 1⅛ inch stream on each story, from each standpipe equipped for Fire Department use, will ordinarily be all the heavy hose service required. In some cases, however, where the conditions are such that streams from two stories may be readily brought to bear, it may be advisable to make the standpipes large enough for two standard streams at each story.

Where the building is so designed that fire can readily spread from story to story and where roof hydrants and exterior streams are necessary, the size of the standpipes should be increased to supply the number of streams which the conditions indicate will be called for at the same time.

In buildings where the exterior exposures are such that monitor nozzles or roof hydrants are desirable and the simultaneous use of fairly large streams is likely to be necessary at several stories, the standpipes and connections must be large, possibly in excess of eight inches. The number and size of the streams required for effective service of this character, particularly in high buildings where it may be only possible to fight fire from the nearby buildings, are the largest factors influencing the size of the standpipes intended for use by public Fire Departments and trained private fire departments. The necessity for

large standpipes was clearly evidenced during the burning of the Equitable building in New York last winter. The part played by standpipe and hose equipments at this fire is prominently mentioned and analyzed in some detail in the very comprehensive report issued by the New York Board of Fire Underwriters.

The standpipes used solely to supply the first aid streams operated by the occupants of buildings may be comparatively small, as those streams do not require water in much volume and will ordinarily only be employed in the story where the fire originates. The amount of water required for such streams would not be a factor in determining the size of standpipes where they are supplied by the larger standpipes equipped for Fire Department use.

Connections to the standpipes should have as few changes in direction as the construction of the building and the circumstances will permit, and should be provided with long bend fittings. The connections from tank supplies should be made to the top of the standpipes, and where several standpipes are employed they should be cross connected at top and bottom and each source of water supply properly checked against the others.

The connection from each source of water supply should be independent, direct and as large as the class of service requires, or large enough to deliver its maximum volume of water per minute without undue loss by friction. Particular attention should be given to the size of the connections through which the standpipes are supplied by City Fire Departments, as it is from this source that water in the greatest volume must often be secured for the longest periods of time.

NUMBER OF STANDPIPES.

The number of standpipes necessary for proper protection is governed by the area and design of the building, the obstructions affecting accessibility, the exterior exposures, the length of hose which can be effectively handled, the facilities for fire extinguishment otherwise provided, and in some measure by the occupancy and the character of the construction of the building.

There should be one or more standpipes in each building and in each section of a building divided by fire walls.

All portions of each story of the building should be within the reach of at least one effective first-aid fire stream supplied through hose not exceeding 50 feet in length, and also within the reach of at least one standard 1⅛-inch stream supplied through hose not exceeding 100 feet in length. Proper allowance should be made for all obstructions interfering with laying the hose or the application of the streams. Partitions, stock, machinery and fixed obstructions incidental to the occupancy constitute the most common obstructions likely to have an influence on the number of standpipes required.

Long lengths of hose should be avoided as they are difficult to handle, liable to kink and interfere with the effectiveness of the stream and cause the loss of time when it is most valuable. It is important, therefore, that the standpipes supplying the smaller first aid streams be in sufficient number to permit their prompt and effective application. Where the occupancy is specially hazardous, a number of short lengths of the smaller hose at very frequent intervals may sometimes be supplied by lateral pipe connections from one standpipe. Extra hose stations or hose stations necessarily located to one side of the standpipe may also be supplied by lateral connections to the standpipe.

The standpipes equipped for use by Public Fire Departments and those trained in handling the larger fire streams may be fewer in number and provided with longer lengths of hose. The larger streams will usually be brought into play after the fire has gained some headway, employed as a protection against exposing fires, or in fighting fire in adjoining buildings. The greater power of the larger streams and their ability to reach the seat of fire from greater distances has an important influence on the number of larger standpipes required. These standpipes may also be used to supply the smaller first-aid streams for the areas in which they are located. When the area of the building is small, standpipes provided with large and small hose equipment may be all that is necessary for full protection.

In buildings where the first-aid fire streams can properly be supplied from a system of automatic sprinklers, the number of standpipes can be confined to those supplying the larger streams for Fire Department use.

LOCATION OF STANDPIPES.

Questions relating to the design of the building, the accessibility of all portions of the interior, the safety of those on whom dependance must be placed for the operation of the system, and the exterior exposures, are the most important factors influencing the location of the standpipes.

For mercantile and manufacturing buildings, and buildings which are not divided by numerous partitions, standpipes from which the first-aid fire streams are supplied are best located next to columns in

or near the middle of the building, particularly where the area is large and the building is of considerable width. Where the building is narrow and where the area can be properly covered by standpipes on each side, the side central location may be found most suitable. The standpipes should be so located that the hose stations are unobstructed by stock, machinery or obstructions incidental to the occupancy.

For hotels, office buildings, and buildings which are divided by numerous partitions, the standpipes should be located in the passages and corridors and so spaced that fire in any room can be quickly reached by at least one first-aid fire stream.

The exterior exposures should be taken into consideration in the location of the standpipes from which the larger fire streams are taken, particularly where the buildings are high and not separated by wide streets or open spaces. Under such conditions streams from nearby buildings may be the only available means of fighting fire.

Standpipes are most commonly located near stairways or within enclosures containing the stairs and elevators. Where such shafts are well designed to keep out fire and smoke and provide safe entrance and exit, they form a desirable location for some of the larger standpipes. Where the stairs are not enclosed and particularly where several are provided, it may, in some instances, be more desirable to locate the standpipes between the stairways.

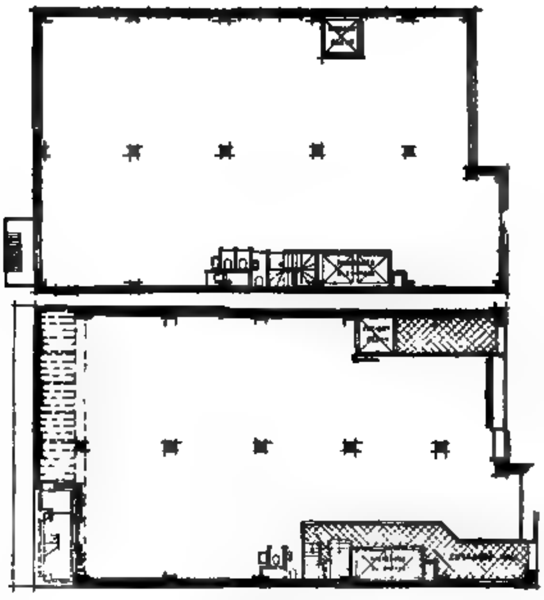
Stairways are usually few in number, widely separated and frequently unenclosed. Such conditions afford little sense of security against fire, and effective service from inside fire streams in the hands of the occupants can, at the most, only be expected during the incipient stages of fire. On this account great care should be taken to locate in convenient and conspicuous places, the standpipes from which first-aid streams are to be taken.

As the safety of the occupants of buildings, as well as the safety of those on whom dependance must be placed for the operation of the fire-fighting apparatus, is dependant to the greatest extent on the enclosures of the stairways, elevators and vertical openings through buildings, the erection of new buildings and the continued occupation of existing buildings should be conditional on the proper safeguarding of the vertical hazard.

MICHIGAN CENTRAL RAILWAY STATION, DETROIT, MICH.

Front Brick: Harbison-Walker Refractories Co
Terra Cotta. Federal Terra Cotta Co.
Sebco Expansion Bolts Used.
Evans' Crescent Expansion Bolts Used.

Warren & Wetmore, Reed and Stem, } **Associated Architects.**



LOFT BUILDING 114-116 E. 16TH STREET, NEW YORK.

Vault Lights: Berger Mfg. Co. Squires & Wynkoop, Architects.
Sprinkler System: Automatic Sprinkler Co., of America.
Electrical Contractors. Porsth Electric Co.
Stanley Ball Bearing Hinges Used.

LOFT BUILDING ON 16TH STREET THE ELEVATION IN DETAIL.
Squires & Wynkoop, Architects.

LOFT BUILDING ON 16TH STREET. TERRA COTTA DETAILS.
Squires & Wynkoop, Architects.

BUILDING AT 5TH AVENUE AND 12TH STREET, NEW YORK.

Maynicke & Franke, Architects.

Grant Overhead Pulleys.
Kalamein Windows: The Kalamein Co.
Switchboards. Metropolitan Electric Mfg. Co.
Painting: W. P. Nelson Co.
Stanley's Metal Door Butts used.

Questions That Every Architect Must Ultimately Answer For His Client

"How can the **wasted** effort in my plant be eliminated ?"

"How can I cut down the Time and Cost in Merchandise, Freight, and Passenger handling,---and in the performance of work of various kinds ?"

"How can I equip my Store, Factory, Warehouse, Shipping Platform, Railway Freight Station, Steamship Dock, etc., so as to effect the **Little Savings** in each operation, and provide for the utilization of every ounce of my employees' energy and every second of their time ?"

These are the questions that are being asked by every progressive business man today. They are **Vital Problems** that you will be called upon to answer.

Of all scientific methods and inventions for the *saving of time, the conserving of human energy, and for economizing in cost* nothing has proved so wonderful or so effective in the enormity of its savings as has the

Otis Inclined Elevators

For Merchandise and Freight Handling

AND

Escalators (or Moving Stairways)

For Passenger Service

By the Use of which 60 per cent. to 80 per cent. of the Time and Cost is Saved Over Old-Time Methods of Freight and Passenger Handling

If you have not seen these types of elevators in operation, or studied the greater efficiency which they effect, you can hardly imagine the incomputable advantage such apparatus will give to your clients in their new buildings and their old where apparatus is required for the handling of great volumes of merchandise or freight, or of passengers en-masse.

Let us get closer together in the study of this type of elevators for your and your clients' benefit. We will be pleased to confer with you at any time and explain the apparatus in detail, and take you to places where such apparatus is already in successful operation. Without obligation our Engineering Department will supply full information to meet specific requirements. Your inquiries and appointments are earnestly solicited.

Otis Elevator Company

Eleventh Avenue and Twenty-sixth Street, New York

Offices in All Principal Cities of the World

BOOK REVIEWS

BRAZING AND SOLDERING. By James F. Hobart. Fifth Edition revised and enlarged. New York: Norman W. Henley Publishing Co. Price, 25 cents.

This pamphlet which appears in a fifth edition is a short, practical treatise on the subject of brazing and the appliances used in that process, including as well an article on soldering, and the tools and materials. There are special portions on methods of soldering for electrical work, tin plate and special solders. There are numerous diagrammatic illustrations and formulas for compounding solders.

MY TOWN, or Community Patriotism, by George Blackstone Irving. The Ryerson Press, Chicago, Publishers. Price, 50 cents.

How often do we hear the phrase from the citizens thereof: "This is a rotten little town." And mostly they speak the truth. The town is rotten, politically, structurally and actually. Yet many little towns are waking up, and also many big towns, to better things. This book, with its sub-title of "Community Patriotism," is a good deed and its author, Mr. Irving, has a worthy enterprise. He deserves to succeed in his special line of engineering, which is the instruction of towns in better ways to be towns.

THE HALF-TIMBER HOUSE: Its Origin, Design, Modern Plan and Construction. By Allen W. Jackson. New York: McBride, Nast & Company. Price, $2.00, and 20 cents postage.

This book, which is written essentially in a popular style, aims to fill the wants of the layman who is interested in the subject, who is looking around for a style which will suit his taste in which to build his home. It is not intended for the professional man except as it may appeal to him as an artistic production. The illustrations are very largely drawn from English examples, the number of American examples being quite limited. Little sketches here and there throughout the text explain in a simple way the minor details of construction. Naturally a style which has its home in England needs some adaptation to meet American needs. In two chapters of the book, entitled "Is the half-timber style suited to our needs to-day?" and "English and American house plans," the author shows that the practicability of the style is a mere matter of adaptation which, in the hands of a skillful architect, is a matter of easy accomplishment.

CONCRETE WORKERS' REFERENCE BOOKS. No. 10, Mounding concrete flower pots, boxes, jardinieres, etc. No. 11, Moulding concrete fountains and lawn ornaments. By A. A. Houghton. New York: The Norman W. Henley Publishing Co. Paper. Price, 50 cents each.

These two little books by Mr. Houghton continue the series with which our readers are undoubtedly more or less familiar. It is the purpose of the writer to give methods of construction of simple moulds to produce the various objects defined by the titles. He refers to patent systems of mould construction, but in the main confines himself to styles of mould and methods which can be pursued by any amateur worker. The books are practical in their subject matter and the sketches presented, though rough, give a good working idea of the appliances and methods pursued.

The NATCO HOUSE published for the National Fire Proofing Company by Rogers & Manson, Boston. Paper, 8x10½ inches. Price, 50 cents.

Building a fireproof house is the right kind of a mania for a man to have. The principal trouble has been that not enough men had the mania, and those that did have it had difficulty in satisfying their wants. This little book about small houses built of Natco hollow tile gives the prospective builder an opportunity to make selection from a splendid collection of designs. There are forty or more of these which can be built for a cost of approximately $6,000, some with fireproof floor systems even. All have stuccoed exteriors. Another collection of designs, the work of clever house designers, occupies the remaining pages. These houses are illustrated by photographs with the plans given in sufficient size to be clear. A description accompanies each house, and with some of them cost data is presented.

KING'S SERIES IN WOODWORK AND CARPENTRY. Vol. 1, Elements of Woodwork; Vol. 2, Elements of Construction; Vol. 3, Constructive Carpentry; Vol. 4, Inside Finishing; Vol. 5, Handbook for Teachers. By Charles A. King. New York: The American Book Co. Cloth. Price, ——

This series of five volumes consists of two books of elementary nature suitable for pupils in manual training schools where elementary woodwork is taught; two volumes are intended for technical, industrial or trade schools and for the use of those students who have passed through the work defined in the first two volumes, or an equivalent; the fifth book is intended for the teacher using the previous four,

(Continued on page 21.)

Art and Architecture

The Year Book of the Merchants' Association of New York contains a frontispiece which is an illustration of the Woolworth Building. This is shown in connection with the announcement that after February 1, 1913, the association will occupy the southerly half of the ninth floor in this building.

Among the activities of the association during the last year which have borne fruit was the effort of the association's insurance committee in drafting and securing the passage of a law for creating in New York City a Bureau of Fire Prevention. The Hoey fire prevention law, which was finally passed, although somewhat modified from the association's original draft, is an effort to be proud of, and the future will tell us more of its benefits.

Mr. Charles William Eldridge desires to announce that Mr. Veredon William Upham has become junior member of the firm. Henceforth the firm will be known as Eldridge & Upham, and will continue the practice of architecture at the present address, 1227-1229 Granite Building, Rochester, New York.

The American Society of Engineering Draftsmen elected Miss Marie Oberlander a junior member at their meeting of May 16th, the first woman to be elected to membership. She is a student of architectural drawing at Teachers' College, Columbia University. At this meeting Mr. F. F. Nickel, M. E., delivered a lecture on "Practical application of the slide rule" and Mr. R. E. Boehck delivered a paper on the "Development of Logging Machinery," which has been printed for distribution.

THE SAN FRANCISCO CHAPTER A. I. A. JUNE MEETING.

The San Francisco Chapter met at the Palace Hotel on Thursday evening, June 20, with a large attendance of members and several guests. The business of the meeting was rapidly passed and the reports of the committees were in the main brief. Mr. Howard, as chairman of the San Francisco Sub-Committee on Competitions of the A. I. A., reported that the City Hall Competition had been completed and judged, with the result that Messrs. Bakewell and Brown had been awarded the first prize. He also added that the competition had been most gratifying in its showing of talent, care and skill and resulted in what he believed to be the selection of the best of many excellent designs. An important matter that was brought before the meeting was a motion by Mr. Polk which was seconded and carried, that the chapter recommends that Congress take no further action toward repealing the Tarsney act and that in the reconsideration of the present action it call in the A. I. A. into consultation to find out if the Tarsney act could be improved towards the betterment of architecture and the efficiency of government work, and also that the chapter transmit immediate word to Glen Brown and California's representatives in Congress.

Resolutions on the death of Mr. Daniel H. Burnham were passed. The guest of the evening was Mr. Walter Cook, president of the A. I. A., who addressed the chapter at some length.

The Department of the Interior, Bureau of Mines, has made a reprint of Bulletin No. 39, the smoke problem at boiler plants, a preliminary report, by D. T. Randall. 31 pages. Reprint of United States Geological Survey Bulletin 334, revised by S. B. Flagg.

The Bureau of Mines has copies of this publication for free distribution, but cannot give more than one copy of it to one person. Requests for all papers cannot be granted without satisfactory reason. Applications should be addressed to the Director of the Bureau of Mines, Washington, D. C., and the publication ordered by number and title.

THE STANDARD BUILDING CODE.

We have previously commented on the work of the National Board of Fire Underwriters in formulating building codes. Their standard code together with their offer of advice and suggestion has met with favor apparently in several localities. Springfield, Mass., Amsterdam, N. Y., Birmingham, Ala., and San Diego, Cal., have all adopted codes approximating the standard set by the National Board. Others are in line, and when the full roll call of the results is obtained it will be a large one. The National Board will send a copy of their model code to those in authority anywhere, and if the results meet with wide success, as they deserve to, there should be a great improvement in protective conditions and much done to prevent fires.

LAKE COMMERCE DURING MAY, 1912. IRON ORE SHIPMENTS.

The volume of domestic commerce on the Great Lakes during May of the present year shows a marked improvement when compared with that of May, 1911, according to reports received by the Bureau of Statistics of the Department of Commerce and Labor. The freight shipments during the month aggregated 10,891,220 short tons, an increase of 24 per cent. over the shipments a year ago. This increase was due mainly to the larger iron ore shipments, the shipments of other leading articles except lumber, namely, flour, grain and coal, having declined.

The May, 1912, iron ore shipments from Lake Superior and Lake Michigan ports amounted to 5,801,449 long tons, an increase of 57 per cent. when compared with the shipments in May, 1911. The shipments from Duluth-Superior amounted to 3,237,559 long tons, an increase of 48 per cent., and from Escanaba, 652,483 long tons, an increase of 55 per cent. over May, 1911.

CONSTRUCTION DETAILS

We have opportunity to welcome into the field of architecture a new publication which bears the title of this notice. The first issue of its second volume has appeared with the issue of July The particular specialty of the paper is detail drawing and the combination of good photographic illustrations with valuable scale details of the work shown, is something that will be highly appreciated by the architectural designer. The paper is published in St. Paul, Minn. Its subscription price is $6 per year in the United States, or 50 cents per copy.

BOOK REVIEWS

(Continued from page 18)

or for students in normal schools who expect to teach.

Elements of woodwork is the first of the series. It begins with a short chapter on the growth of woods and continues with a well illustrated chapter on lumbering, cutting of lumber and the care and storage of it. Following this is a chapter on the use of tools which is fully illustrated. Of primary importance to the woodworker is the care and preservation of his tools. The purchase of tools and materials, their care and maintenance, is an important idea to instill into the mind of the young workman. To do good work good tools are necessary, and to have good tools the knowledge of their proper use is co-ordinate with the knowledge of resharpening and maintaining them in good condition. There are two short chapters on glue and sandpaper, and wood finishing.

Elements of construction is the second book. It contains a repetition of the care and use of tools presented in the first volume and proceeds to give in the following chapters instruction for the making of working drawings, which are followed by constructive exercises. This chapter gives instruction in elementary woodworking and includes mitering and simple joinery. The next chapter continues to more advanced woodworking and the building of simple furniture. A series of arithmetical questions concerning woodworking closes the volume.

The fifth volume, or Teachers' Handbook, contains hints for instruction in manual training, carpentry and joinery, data for supplies and the outfit for instruction. A chapter on suggestive courses gives various lines of study. The latter half of the volume contains a lot of designs which may be suggested for construction by the students. These, where opportunity offers, vary the courses and serve to maintain the interest of the students.

Fireproofing and Fire-Protection

MR. G. H. STEWART

ANOTHER SPRINKLER TRIUMPH.

A representative of *Architecture and Building* accompanied an insurance inspector through the new building of the Masonic Lodge at 6th Avenue and 23d Street the other day, and while there had the unusual good fortune to witness the extinguishment of a fire by an automatic sprinkler.

A tenant occupying a room on the 10th floor as an office, and with a few cases of piece woolens (the forerunner of a larger stock which is to follow) had engaged mechanics to install partitions for his office. Oil-soaked waste or rags were stowed away by a careless workman with a box of wood shavings behind some cases in a corner of the room and apparently ignited spontaneously. Practically the first notice of the fire came through the operation of a single automatic sprinkler head, almost directly over the fire, resulting in a deluge of water which promptly checked the flames but caused so large a volume of smoke that the building employees hastily summoned felt called upon to use the building standpipe hose. The entire incident was over in a jiffy and no call sent to the public department. In fact, few in the building were aware of the fire.

The management very foolishly, in our opinion, refuses to permit a photograph to be taken. No discredit can attach to either the building or its tenant through the occurrence of this fire, since no amount of supervision, however rigid, may reasonably be expected to cover the removal of every bit of rubbish in an establishment as large as this one, especially where portions are still in an unfinished condition. The tenant had only a very small part of his stock on the premises, and being without insurance could hardly be accused of connivance. On the contrary, the ease with which the fire was controlled, if not actually extinguished, is one of the strongest points the rental agents might urge upon prospective tenants as illustrating the almost absolute security furnished by the automatic sprinkler equipment.

This happened to be a day fire. Had it been at night, the result would have been in no way different. Such trifling damage as there was is due to water—the sides of the

(Continued on page 26.)

ROCKWOOD SAFETY LOOP SPRINKLER

SHOWING SPRINKLER WITH THE TWO HALVES OF THE STRUT SOLDERED TOGETHER.

SHOWING HOW THE TWO PARTS OF THE SOLDERED STRUT SPRING APART *ONLY AFTER* THE LUMP OF SOLDER IS *MELTED* AWAY FROM THE LOOP.

THE ROCKWOOD SPRINKLER IS UNIQUE IN THAT THE TWO PARTS OF THE SOLDERED LINK ARE HELD TOGETHER, NOT MERELY BY A SWEATED SOLDERED JOINT, BUT BY COVERING THE END OF THE LEVER WITH A SMALL PIECE OF SOLDER WHICH IS MECHANICALLY BOUND TO THE STRUT BY A LOOP OF WIRE RIVETED THROUGH ONE PART OF THE LINK.

THE ROCKWOOD SPRINKLER IS THE ONLY APPROVED HEAD THAT IS INCAPABLE OF OPENING ITSELF BY THE BREAKING OF THE SOLDERED JOINT, WHICH MUST ABSOLUTELY MELT TO OPEN. IT IS THUS IN A CLASS BY ITSELF, SUPERIOR TO ALL OTHERS.

ROCKWOOD SPRINKLER CO.

OF MASSACHUSETTS

MANUFACTURERS, ENGINEERS AND CONTRACTORS FOR COMPLETE SPRINKLER EQUIPMENTS USING WET OR DRY SYSTEMS.

38 HARLOW STREET **WORCESTER, MASS.**

NEW YORK - -	123 WILLIAM STREET	CHICAGO -	3004 SOUTH MORGAN STREET
BOSTON - - -	141 MILK STREET	SEATTLE - - -	208 COLUMBIA STREET
BUFFALO - -	300 PRUDENTIAL BUILDING	MONTREAL - -	141 ST. MAURICE STREET

packing cases are scorched, but not burned. The promptness of the building employees in bringing into play the hose from one of the standpipes is so commendable that we cannot repress our surprise that its value as an advertisement for the building should have been missed. Altogether the case is one of the finest illustrations of the value of the automatic sprinkler, when properly installed, that has come to our notice, which seems sufficient excuse for this extended reference.

Again, it is a pleasure to see the results of good construction The concrete floors of the Masonic Building held the water and no damage was caused on the floors below when the Grinnell automatic sprinkler operated and the house hose stream was brought into play.

A MILE OF BARRETT SPECIFICATION ROOFS.

An interesting perspective sketch of the Bush Terminal buildings in Brooklyn has been prepared by the Barrett Manufacturing Company, showing the extensive use of the Barrett Specification roof in that large and busy center. A letter which they publish shows that the Bush Terminal Company is well satisfied.

The total roof area of these buildings is 3,100,000 square feet, which is more than 70 acres. There are 181 different buildings and they stretch for a mile along the shore of South Brooklyn. A summary of the advantages of the roofing is as follows:

1. Low first cost.
2. No maintenance expense such as painting, etc.
3. They are not injured by steam, gases and acid fumes.
4. They are fire retardant and take the base rate of insurance.
5. The net unit cost, that is, the cost per foot per year of service is lower than any other type.

A NEW CATALOGUE ON METAL LUMBER

The Berger Manufacturing Company has recently issued a very elaborate and extensive treatise on the subject of metal lumber, a substitute for wood.

It has isometrical drawings, sectional views showing the application, together with illustrations showing the erection of different types of buildings with metal lumber and fire tests of the construction

The material is a sheet metal product which

(Continued on page 28)

replaces wood stick for stick, but it does not replace structural steel.

We understand that by writing direct to The Berger Manufacturing Company, general offices, Canton, Ohio, a copy can be secured gratis.

BUILDING TECHNICALITIES.

The Canton Manufacturing Company, of Canton, Ohio, has issued a mass of technical information concerning their products under the title above. Further, in a sub-title, it is stated that they present useful information for specifications for fireproof, adjustable windows, fireproof doors, ventilators, skylights, architectural sheet metal work and metal ceilings. The form in which this has been presented is that of the ordinary, typewritten specification, but it contains throughout many line drawings, showing details of the construction of metal windows, metal doors, etc. The presentation is a novel one, and its usefulness particularly commends it, as it gives in concise form just the information that the specification man needs in drafting the specification of a building.

FIRE UNDERWRITERS' LEGISLATIVE BUREAU.

The fire underwriters of the country, speaking through the action of the National Board of Fire Underwriters at its annual convention held May 23, 1912, unanimously decided in favor of the establishment of a legislative bureau for the purpose of dealing with legislative matters in the various States which may have any material bearing upon the business of fire underwriting, and especially such measures as are inimical to fire insurance companies' interests. The plan for the proposed bureau provides for an organization which will be operated under a high-grade management which will relieve the various underwriters' committees of the work which has heretofore been imposed upon them in the looking after legislation in the various States affecting fire insurance.

The National Board, at the meeting which was held at the Waldorf-Astoria Hotel, also adopted measures to provide for a continuation of all the important fire prevention measures which it has undertaken during several years past, such as the maintenance of the Underwriters' Laboratories, the support of the National Fire Prevention Association and the work of securing a standard building code for all large cities. The means for carrying out all these measures were provided for by the levying of assessments upon the premium income of the members.

The conditions prevailing in fire underwriting as a whole during the year 1911 were shown to have been far from satisfactory in the point of profit. The figures presented by the president of the board in his annual address gave the total premiums of 180 joint

(Continued on page 30.)

ELEVATOR SHAFT CONSTRUCTION

By H. ROBERT CULLMER

Assisted by ALBERT BAUER

Practical Suggestions for the Installation of Elevators in Buildings

A treatise for the architect and builder covering the surveying and preparing of detail drawings for elevator shafts; machine rooms; elevator bulkheads; tables and formulae for calculating the size and capacity of elevators; freight elevators; sidewalk elevators; dumb-waiters; specification writing for elevator installation; elevator shaft doors and appliances; building regulations covering elevator installation.

Cross Section of Elevator Shaft and Bulkhead.

Elevator shaft construction in buildings has never before been technically treated. This book supplies the demand for information on this subject, and it has been the effort of the author to supply the necessary data for the use of the architect in placing an elevator equipment in any building. New York practice is followed, and the Building Department laws and regulations of New York are made the standard. The author has also made a careful study of the regulations in use elsewhere, giving the deviations from New York requirements. Specification writing for elevator equipment has been covered by two forms; one a simple specification for a single elevator, the other a more elaborate equipment embracing several styles of cars suitable for an office building.

The book contains most practical information and it is the hope of the author that he has omitted no important point. Every phase of the shaft problem in building construction has been covered, and the method of presentation is such that ready reference is possible to any detail of the subject.

The book is in companion size with the **Building Construction and Superintendence** Series, by Mr. F. E. Kidder.

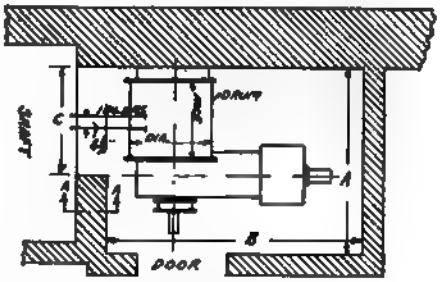
Cloth bound, 170 pages, Frontispiece, 47 diagrammatic plates, 16 illustrative plates

Price $3.00

Publishers

The Wm. T. Comstock Co.

23 Warren Street, NEW YORK



Plan of a Machine Room.

stock fire insurance companies as $294,071,982, out of which losses paid amounted to $158,392,630. The liabilities on account of unearned premiums were increased by $16,840,733, and the expenses of operation absorbed $116,900,483, thus leaving an apparent underwriting profit on the year's business of $1,938,136, or an equivalent of .006 per cent of the total premiums. The record of ten years' fire underwriting showed even less favorably. The total premiums during the period 1902 to 1911, inclusive, were $2,428,497,862, the losses paid were $1,363,247,836, the increase in liability for unearned premiums was $150,394,185 and the expenses of operation were $927,256,324. This resulted in an apparent underwriting loss of $12,400,483, equivalent to .0051 per cent of the total premiums during the period.

The new Bureau of Fire Prevention, which has jurisdiction over exits, fire escapes, stairways and fire preventive appliances in approximately 65,000 buildings in Greater New York City, has a staff of about ninety men who are employed as inspectors to look after these buildings. Thus each man has about 725 buildings for his personal inspection. According to report, the number of fires in Greater New York City has decreased about 20 per cent. since October 15, 1911. This has resulted in a considerable saving to the insurance companies and will eventually mean a lowering of insurance rates, which, it is needless to say, will be greatly appreciated by the property owners in the greater city.

The Master Builders' Association has been making an investigation of the Fire Prevention Bureau, which is under the direction of Fire Commissioner Joseph J. Johnson, and Mr. Frank M. Patterson, president of the association, strongly commends the department and gives Mr. Johnson credit for the reduction in the number of fires which have occurred during the period of his incumbency. It is estimated in the Master Builders' Association report that in a few years' time this Bureau should be able to cut down the number of

(Continued on page 32.)

fires at least 40 per cent. Thus far, 762 buildings have been equipped with fire escapes, in 327 buildings alterations to stairways and exits have been made in compliance with the new law, and fire preventive appliances have been installed in 436 buildings. In 973 other buildings a general cleaning up has been ordered and effected, rubbish and other inflammable material being removed from them.

INCREASE IN BUILDING.

It is gratifying to note that there has been a general increase in the amount of building as gauged by the permits, and as reported in "Dun's Review." The gain for the month of May this year over last year is 11.8 per cent. in fifty of the leading cities of the United States, the total aggregate being $59,285,201, as against $53,029,500 last year. The gain in New York City for the various boroughs shows an increase of 29 per cent., the largest increase of all. For the other forty-nine cities the gain amounts to only 3.2 per cent. For the first five months of this year the building permits totaled $268,128,868, as against $248,975,558 last year.

For the month of June building in Greater New York shows a slight falling off over the figures of last year, a decrease of 9 per cent. This is due to a pronounced contraction in Brooklyn, which counteracts the effect of the increased building in Manhattan and the Bronx. Elsewhere in the East, taking the aggregate for all cities included by "Dun's Review" in that section, there is an increase of 18.7 per cent. At some centers, such as Buffalo, Hartford, Rochester, Springfield and Worcester, the gain is large. In the South in general there is a decrease to the extent of 15.2 per cent. less than last year. The West shows considerable activity, very large gains being made in several of the Middle-Western cities. On the Pacific Coast building operations continue at about the same rate as last year.

The total aggregate of $70,064,153 is an increase of 10.2. per cent. over the figures of $63,585,717 of last year. The total for the first six months of 1912 is well above that of 1911, the figures being $355,709,067 for 1912 and $324,162,024 for 1911.

According to present indications in the building field, the outlook is favorable for a continued increase throughout the summer and fall.

If we refer to "Bradstreet's," we find reports from 121 cities of the United States for June showing a total expenditure of $84,023,271, as against $83,668,036 in May, 1912, and $78,308,951 in June, 1911. This shows a 7.2 per cent. increase over the month of June last year. "Bradstreet's" calculations for the six months' period gives a total expenditure of $451,297,895, or a gain of 9.1 per cent. over the same period last year.

These two reports bear each other out in an interesting way and, compiled from independent sources, give an accurate gauge on the building industry of the country.

AUTOMATIC SPRINKLERS AND FIRE-PROOF BUILDINGS.

In a recent address before the New York Insurance Society the following statement was made: "There is one requirement not along structural lines which is absolutely essential for the safety of the contents of a fireproof building and should, in fact, be considered part of any fireproof mercantile or manufacturing house, namely, the automatic sprinkler equipment. No building is fireproof unless it is so arranged and equipped as to make itself and contents safe. This cannot be done in cases of mercantile or manufacturing buildings of the areas and heights now required, in any other way as surely and successfully as by automatic sprinkler protection.

"Let us give full credit to the buildings of so-called fireproof construction which we now have. Such buildings as they, contribute very greatly to the safety of our cities from conflagration. With all their faults they are much less likely to start and spread a serious fire than any sort of wooden construction, but in order to properly show what fireproof construction ought to be it is necessary to point out their present weaknesses. It is perfectly plain that no matter how incombustible the walls, floors, roof and similar details of a building may be, if it is all one room or is not protected with automatic sprinklers, the contents may be burned out just about as easily as though they were in a wooden building. The building value represents usually less than half and sometimes not more than one-tenth of the total value of the plant, and the chief consideration should be given to the safety of the contents."

Lockwood, Greene & Co., architects and engineers for industrial plans, 93 Federal street, Boston, will occupy the seventh, eighth and ninth floors of the First National Bank Building, 60 Federal street, Boston, as soon as the building is completed. The new quarters have been made necessary by their increased volume of business and the need of more commodious arrangement of departments.

Industrial Progress

WHAT THE PASSAGE OF THE BOURNE BILL WOULD MEAN TO THE MANUFACTURER OF BUILDING MATERIALS.

The Bourne bill claims "to establish a parcel post system and to fix rates of postage on certain classes of mail." To welcome this bill as the much-sought-for parcels post system is a delusion, for it will mean for the most part an increase in the present rates and an added cost of postage to the average manufacturer of building materials, and all manufacturers of appliances used in the building trades, who issue circulars and catalogues.

The average catalogue issued by building material men is a valuable and useful article, containing technical information and of more or less educational value to the reader.

Most catalogues come under the weight of four ounces, and the cent-an-ounce rate, proposed in the Bourne bill, doubles the present rate and makes an average 75 per cent. increase in charge.

Further, the cost for shipping small samples, cuts for illustrative and advertising purposes would be considerably increased.

Further, because of the proposed zone system which forms part of the bill, all firms doing business in localities along the sea coasts are discriminated against in favor of those manufacturers who are located in the central portions of the United States. There is no question but that the passage of the Bourne bill would mean an increase in postage of several thousand dollars a year to even the small manufacturer who distributes catalogues, technical matter and samples.

Further, if it is the purpose of the bill to benefit the farmer, as it has been claimed in some sources, this benefit is not at all evident. The direct sale from farmer to consumer is in no way nearer fulfilment than ever. It would be a very small sack of potatoes that would come under the eleven-pound limit.

Every manufacturer who issues a catalogue should inform himself as to the conditions of this bill and make it his business to write in protest to the United States senators from his state and to those United States senators who form the committee on post offices and post roads.

(Continued on page 36)

SOLID PORCELAIN REFRIGERATORS.

Only by building every food compartment of one piece of solid porcelain ware an inch or more thick, without joints or cracks, and with rounded edges and corners, the perfection of cleanliness is reached in refrigerator construction. Thus are Tettenborn refrigerators built. It makes your refrigerator just one great big china dish, though one that is practically unbreakable. The insulation which surrounds the lining or porcelain compartment consists of one and one-half inches of granulated cork rammed tightly between the porcelain and a wall of ⅞-inch tongued and grooved lumber. Outside of this there are two courses of insulating paper and ⅞ inch of solid mineral wool. Another lining of insulated paper separates the mineral wool from the outside case of oak which is handsomely finished. The doors are built up in the same way with an inner lining of solid porcelain.

Another important refrigerator point is the ice chamber. This is solid within, with ⅞-inch tongued and grooved lumber covered with insulating paper and lined with galvanized steel. Within many styles of chamber there is a special rack provided which holds the ice high in the chest and allows a space below for placing bottles so that they get the cold drip from the ice and are chilled to the lowest possible extent. The drip from the ice falls through upon the solid porcelain cover of the food compartment, thus chilling this to the utmost. The drain and drip pipes are of solid nickeled brass, easily removable, and there are no loose parts to get out of order or become lost.

The circulation in Tettenborn refrigerators is most perfectly provided for, the air having free passage from the ice down through the food chambers and up again to the top, where the ice is located and the air becomes again chilled.

Full particulars may be obtained from the Tettenborn Company of Cincinnati, O., and a handsome catalogue will be sent describing the construction and all the styles of refrigerators that they manufacture.

(Continued on page 38.)

In the Essex County Bank, the solid brass cuspidors with adjustable bowls were manufactured by the Cuspidor Mfg. Company. These cuspidors are made of spun brass, polished or dull finish and the manufacturers make a specialty of supplying them in forms that are suitable for any interior, as well as in finishes that correspond with the interior metal work.

Estimates may be obtained and samples may be seen at 40 Lawrence Street, Newark, N. J.

Among makers of plumbers' brass goods few enjoy a more enviable reputation than the Haydenville Company of Haydenville, Mass. Continuously engaged in the manufacture of such goods since 1845, this company has become well known to two generations of architects as makers of a thoroughly reliable line. We have just been informed that the company is about to open a new department of sales promotion at their New York office, 150 Nassau Street. The new department will be conducted by Mr. William R. Pertak, who has been in close touch with New York building interests for some years. Mr. Pertak informs us that he will primarily aim at closer relations between his firm and the various factors in the building trades, whose interests demand the installation of reliable brass goods. Evidently this move is in recognition of the ever-growing tendency on part of architects and their clients to the most painstaking care in the specification of every detail of construction and equipment.

A catalogue, No. 410, has been issued by the H. W. Johns-Manville Company on the subject of modern store illumination. Recently the Johns-Manville Company has become sole selling agent for the Frink products, and they have issued this new catalogue to explain and place before the public the Frink reflector and illuminating devices. The Frink show case reflector used for the J.-M. Linolite, is particularly adapted for store windows, counter cases and other display cases where it is necessary to bring the sources of light within a restricted area. A copy of the catalogue may be obtained by addressing the H. W. Johns-Manville Company, New York City.

A new company with a capital of $100,000 has been formed under the name of the Eureka White Marble Quarries. Their intention is to develop an eighty-acre tract of marble land which is situated in Coosa County, Alabama.

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AND

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Architectural Construction

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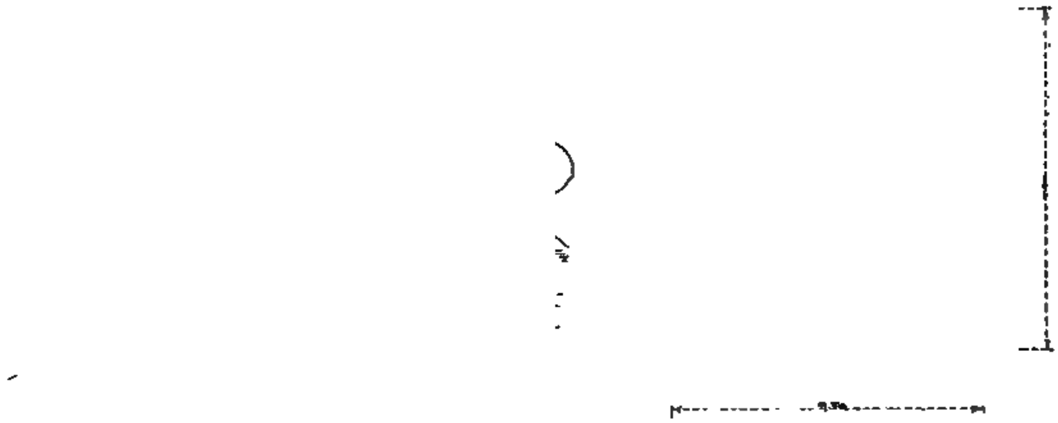
The SWISS CHALET BOOK



IN the series of articles which have appeared in ARCHITECTURE AND BUILDING, Mr. W. S. B. Dana has given an epitome of his researches on Châlet Architecture. In this book, which will be issued shortly, the subject is much elaborated, and both the volume of text and number of illustrations are doubled. There are ten valuable chapters in this new book, one of which treats of the châlet as adapted to American uses. This chapter is well illustrated.

Cloth, 7½ x 10. Price, $2.50

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ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

Volume XLIV. AUGUST, 1912 *Number 8*

THE HOLLOW-TILE FIREPROOF HOUSE

Article IX.—Two Way Concrete Floors

By FREDERICK SQUIRES

A NOTED inventor of airships was recently heard to say that if he ever had to give up the conquest of the air, he would devote his inventive faculties to concrete as the next greatest realm of promise. The greatest American inventor has often forsaken electrical research for the intense delight of delving into the far-seen, yet still unmeasured, possibilities of this fluid birth of stone. Is it not significant that these two great men of the brain have hit on the same thing as their second choice? They feel that in the conquest of concrete is the breeding of giants.

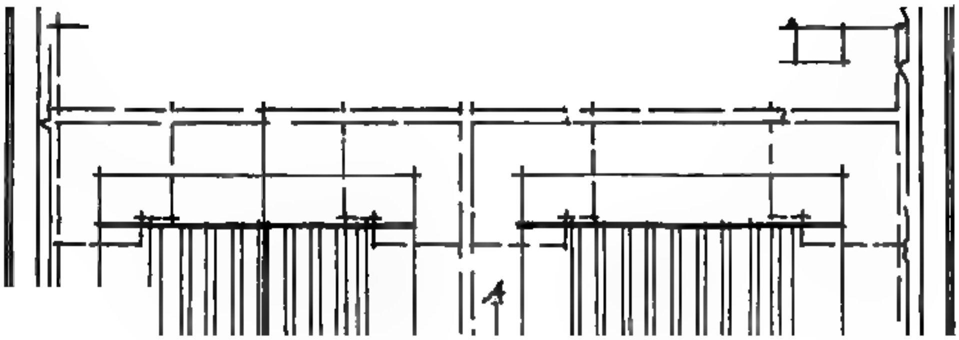
In spite of the fact that its study absorbs great minds, concrete itself is but a homely thing, and it is not with the work of an Edison, but with the simple scheme of a builder, that this article most concerns itself.

Carpenters have used for many a year the principle of two-way floors. They knew that wood floor joists, running from wall to wall, could be greatly strengthened by the use of solid pieces fitted snugly between them and forming a continuous line at right angles to the direction of the beams. This they called cross-bridging.

In a concrete slab, reinforced with wire mesh, the same principle is operative. The slab may be considered as a series of beams side by side and touching, and each beam reinforced with a continuous strand of the wire mesh. Thus, if the mesh were made of wires crossed at right angles, the slab would consist of beams crossed at right angles.

Since the strength of a slab depends directly on its thickness, it was found desirable to resort to beam methods, just as the carpenter does not build a floor of thick planks but of thin boards resting on beams. The formation of a floor of concrete beams with a slab on top (analogous to the wood floor construction) caused difficulty in form work and did not provide a level plaster surface. These difficulties were overcome by using hollow terra-cotta blocks as fillers between the beams, which formed with the bottom of the beams a level ceiling for plastering. But this floor did not provide for the cross-bridging which the carpenter had found so essential to the strength of his wood construction, so the next step was to devise cross-bridging for concrete construction.

I think it was Faber, a German, who first showed us how to cross-bridge a tile and concrete floor. He knew that hollow tile blocks had to be cellular and open on two ends, but nothing daunted by the physical obstacle, he poked paper cylinders into the open ends and spaced his tile fillers as far from each other on their open ends as they were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IEW·SHOWING·T·BEAM·TWO·WAY·HOLLOW·
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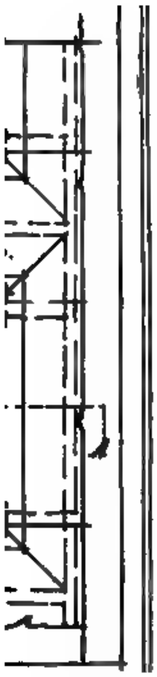
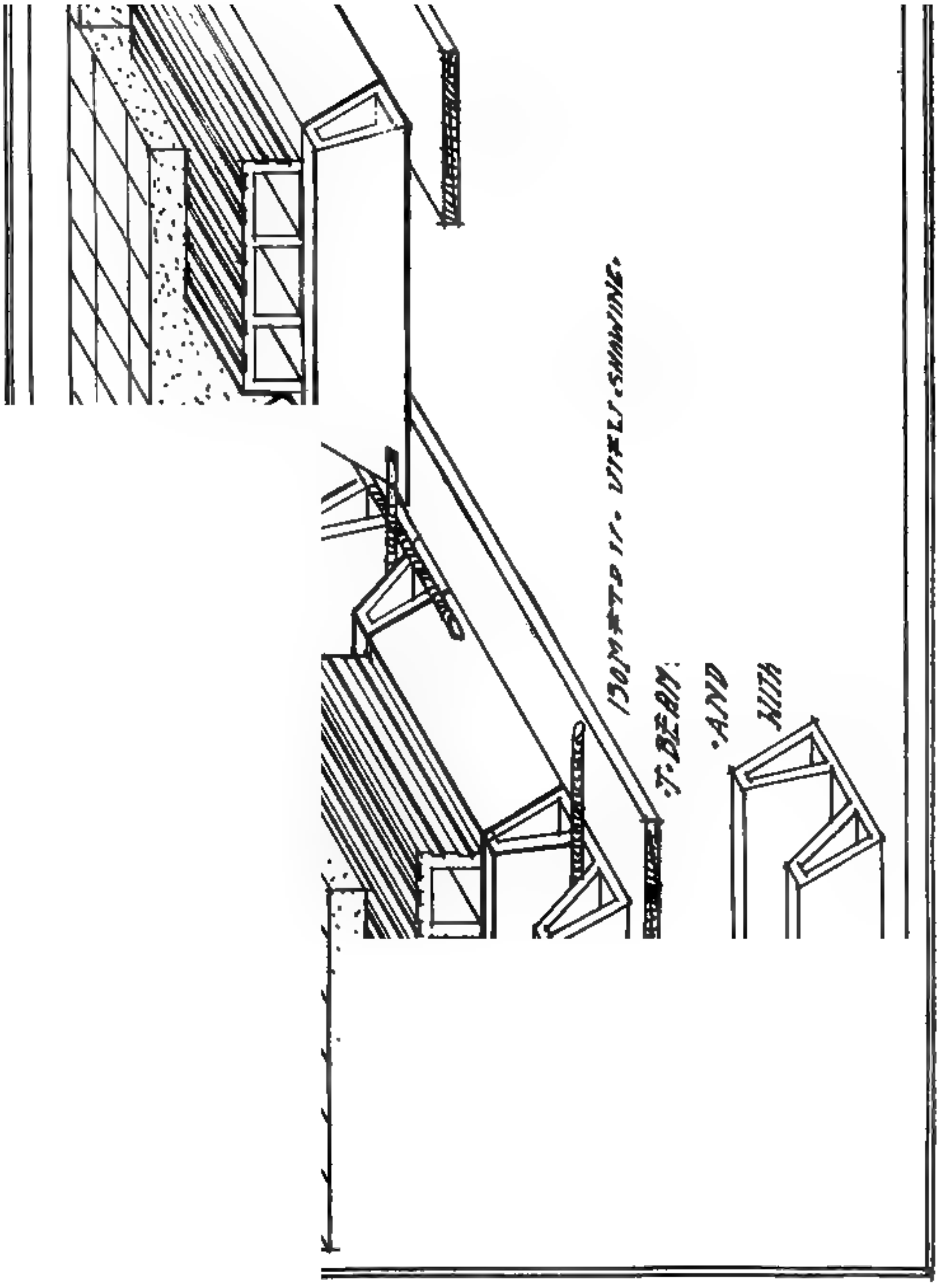



ISOMETRIC VIEW SHOWING
T-BEAM
AND
RIB

from each other on their closed sides. He laid his reinforcement in each set of grooves, which, of course, made it cross at right angles, and poured these intersecting grooves full of concrete, and, presto! we have a gridiron of concrete—a perfect cross-bridging.

Then his protegé, Ferdinand Burkhart, went him one better by devising various ingenious schemes for presenting, not paper, but tile, to the concrete at the open ends of the block. His first scheme was a curious series of squares of tile, each formed of four pie-shaped pieces with the pie-crusts forming the outer edges of the square and the confines of the beam. Having no one else to beat, Mr. Burkhart then beat himself, and his best record is now as follows: the floor unit consists of a standard-sized tile with flanges on the lower edges of its closed sides and which has its open ends closed with channels, each as long as the block. This results when the units are assembled in a nearly all-tile ceiling, a very desirable feature, because untiled concrete beams have a vexatious way of condensing moisture from the atmosphere which collects on the plaster below them and makes their outlines plainly visible in the ceiling. This Burkhart had obviated. A clever young engineer named Schuster meantime had produced his "Union System" which is as simple as rolling off a log. Schuster, however, seems to have been the first to roll off this particular log. His idea was obtained by observation of the actual conditions which arose in pouring concrete. He noticed that it didn't run excessively far into the open ends of a hollow tile, due probably to the fact that the tile absorbed the water of the concrete and checked its flow, just as a blotter will check the flow of ink. He used standard blocks and spaced them just as Burkhart spaced his, but he omitted Burkhart's channels and flanges. Nolan, in Chicago, and another engineer in Washington, closed the open ends with metal and have had a considerable success. A beveled block is also in use and was illustrated in the last issue of this magazine.

Meanwhile a builder had been thinking, while he poured his concrete, and he devised a concrete beam in section like a T, formed by tile blocks sectioned like an inverted T and he adapted this to beams running in one way and in two ways. I guess, as a child, he had been taught to cross his T's for that is the very way he made his two-way system from his one-way system. The builder's name was Harry Vought, Jr.

A glance at the drawings which illustrate this article will suffice to show the reader that his scheme has many of the advantages before described for the other scheme and a good many of its own. I have noted these, as its most obvious good qualities.

The T-shape is a good section for a concrete beam, be it one-way or two-ways, because it puts the emphasis where it belongs. Look at your New York building code. You get a good value for concrete in compression, but how many pounds per square inch in tension? Not an ounce per square mile. In other words concrete below the neutral axis of a beam is valuable only to fireproof the rod and to take care of shear. All tension, if we follow our code, must be provided for in the steel reinforcement. It is true, then, that this T-section provides concrete where concrete is needed and cuts it down to a practical minimum where it has no value.

Mr. Vought's block is an inverted T on the closed sides and the same section is provided in the other sides by placing a loose member similar to the flange of the T along the lower half of the open sides of the block. (See the drawings.) When the beams are

poured, the concrete comes into permanent contact with all sides of the block above the neutral axis in the compression area, even entering the open ends to some extent. There are no dry tile joints to make the value of the compression uncertain owing to the necessarily imperfect contact between slightly warped and curved tile faces, where contact may only be considered as occurring at points. Such imperfect contact occurs, it is true, below the neutral axis, but here the tile and concrete are merely fillers and subjected to tension (if such force is not entirely taken by the steel) which would tend to separate not compress the tile. A glance at section A-A shows all concrete excluded from the open ends below the neutral axis by the filler where it would be a dead load and allowed to run into the open end, even forced in, in general practice, above the neutral axis where it aids by adding to the compressive section. It will be readily seen that the whole top of this block must join the concrete in the compressive area, so that the whole top of the slab is in compression. This scheme of closing the right part of the open end of the block seems to me to be one of the strongest recommendations of the Vought system.

Some of the two-way schemes which I have described have novel ways of providing an all-tile or nearly all-tile ceiling. All-tile ceilings are easily made by Mr. Vought's system, as is shown in the second ilustration.

Section A-A in the illustration of the second method shows a block where the leg of the T converges to a point. The filler shown in section B-B has a similar section and is cut off on a bevel so that when set alongside of the big block it forms with the legs of the T a bevel all around the unit. These beveled units when placed edge to edge, as is done to form the beams, present from below an all-tile ceiling. It is noteworthy that this method of the Vought system does not require tight centering. It is seen then that this system presents the advantages of a section which is in conformity to the physical powers and limitations of concrete, that it makes the tile do actual work in the slab, induces concrete into the compressive and excludes it from the tension part of the section of the slab, permits open centering and produces an all-tile ceiling for plastering. Not such a bad showing for a builder's invention.

In concluding this article, I would draw attention to the great number of clever men who have worked on two-way tile and concrete floor construction, and the many good and workable schemes that they have devised. One may bring his idea from Germany, another may get it from thinking while he works, another from close observation of the physical attributes of tile and concrete, and another may conceive his scheme by the geometrical turn of his mind. But all together, consciously or unconsciously, willingly or unwillingly, are aiding the march of building progress headed by "King Concrete." If you are cocksure that you and your system have won, you are only sure to see a neglected warrior rise up on your battlefield with the cry, "I have just begun to fight."

Do not despise your fellow worker, for you may be sowing dragons' teeth. So let no one claim the victory, for victory means the end of the fight, and the end is not yet, for the end is perfection.

SENECA BUILDING, BUFFALO, N. Y

McKenzie, Voorhees & Gmelin, Architects.

Wood Doors and Trim: G. Elias & Bro.
Otis Elevators.
Fireproof Windows: S. H. Pomeroy Co., Inc.
Grant Overhead Pulleys Used.
Star Expansion Bolts Used.
Chicago Triplex Butts and Hinges.

FAILURES IN BUILDING CONSTRUCTION AND THEIR LESSONS.—II.

COLUMNS

By EDWARD GODFREY

COLUMN failures are numerous and are the result of several causes. Some of the chief causes can be laid at the door of engineering books and afford examples of too much mathematics and too little common sense.

A column to be strong must be made of a material having good tensile strength. Or, if the material used has not much tensile strength, it must either be reinforced for tension or given a very low unit stress in the design.

A column may fail in two distinct ways, namely, (1) as a bow or spring altogether independent of the ultimate compressive strength or elastic limit of the metal, (2) as a member in compression, crushing the fibers.

These simple and easily demonstrated facts are practically totally absent in engineering books dealing with the subject of columns. The result is absurd and weak designs of columns.

Instead of recognizing the two distinct phases in the strength of a column, the two are combined in the Gordon-Rankine formula, and absurd results are attained. It is true that there is a range (in columns of intermediate lengths) where there is a combination of the effects of spring and crushing of metal. There is also a range (in short columns) where a column could not fail by springing or bowing, but only by crushing the metal; as well as a range (in slender columns) where crushing of the metal cannot take place until the column has failed by springing. Failure to recognize these distinct phases of the strength of columns and to separate and differentiate them has led to many gross errors and many failures.

As the writer has pointed out, in "Railway Age Gazette," July 2, 1909, and more fully in his book, "Steel Designing" (at present in manuscript), the Euler load is the absolute maximum load that any column can sustain, irrespective of the ultimate strength or elastic limit of the steel, in spite of the fact that the Gordon-Rankine formula shows for slender columns ultimate strengths several times the Euler load. And the Gordon-Rankine formula is the one that architects and engineers very commonly use to design their columns. Books say of the Euler load that "under this load the column just begins to deflect, and will under a constant load retain any deflection which may be given to it, within the elastic limit of the material." The elastic limit does not enter in the formula or its derivation, and there is no proof of any such thing in the common derivation of the Euler formula. Such statements as the one above quoted are misleading, as they give designers the notion that there is still some reserve strength in a column after the Euler load is reached.

The Gordon-Rankine formula has no application whatever to slender columns, and, on the other hand, the Euler formula has no practical application to short columns. These facts are of more real value to a designer than pages or volumes of intricate mathematical formulas. If they are known to book writers, they have been carefully suppressed. Hand books give the supposed ultimate strength

of a pin-ended column in medium steel whose ratio of slenderness (length divided by least radius of gyration) is 240, as nearly 12,000 lbs. per sq. in., by the Gordon-Rankine formula, whereas the absolute ultimate strength of such a column, even if it were made of steel having an elastic limit of 200,000 lbs. per sq. in. or more, is actually only 5,000 lbs. per sq. in. They give the ultimate strength of a column whose ratio of slenderness is 40 at about 47,000 lbs. per sq. in., whereas such columns under test will not show much more than two-thirds of this ultimate strength.

A straight line formula for safe loads in columns is the most reliable for several reasons. First, it agrees more closely with experiments than any other. Second, the values lie wholly within the Euler curve. Third, it shows less values for slender columns and thus discourages their use. Fourth, it agrees closely with the theoretical strength of columns on the assumption of proportional shop imperfections. The latter is shown by the writer's paper in "Railway Age Gazette."

The other basic and suppressed fact referred to in the beginning of this article is that a column, to be strong, must be of a material having good tensile strength. This is so rare a piece of information that when recently at a meeting of engineers a well-known investigator stated that high tensile strength in the concrete of a reinforced-concrete column increased the compressive strength of the column, one of the principal engineering papers of the country made a special news item of it. The writer has been emphasizing this fact in his articles and books since 1907, when he pointed out, in an article in "Concrete Engineering," the fact that cast-iron columns, made of a material having an ultimate crushing strength of about 100,000 lbs. per sq. in., are designed (when properly designed) by a formula the base unit of which is 7,600 lbs: only 7.6 per cent. of the ultimate strength—and this because of the weakness of cast iron in toughness or tension. He also emphasized the blatent error of designing so-called reinforced-concrete columns of practically plain concrete, on a formula the base unit of which is 7.50 lbs.—a material one-fiftieth as strong in compression and one-hundredth as strong in tension with a supposed "safe" unit one-tenth as great.

There have been many failures of slender columns. Some of them have been deliberate designs by specialists not aware of their weakness by reason of the misleading character of the information imparted through books. The slenderness is sometimes in the column as a whole and sometimes the result of inadequate means of uniting the component parts of the column.

An experienced designer, proportioning a column by the Gordon-Rankine formula, the ratio of slenderness of the column being about 240, could not understand why such columns showed weakness and why the ultimate strength was not about 20,000 lbs. per sq. in., as the formula showed. The writer had difficulty in convincing him that the ultimate strength of his column was about one-fourth that which he assumed, not only because it was too slender to be in the range of the Gordon-Rankine formula, but also because it was not fixed ended, but more nearly pin ended. The end connection was to gusset plates in the plane of the web of the light channels of which the compression member was made. This is practically a pin-ended connection, for such gusset plates cannot maintain fixedness of the axis of the member at the ends.

Fig. 1 shows this compression member and its connection. The dotted lines in-

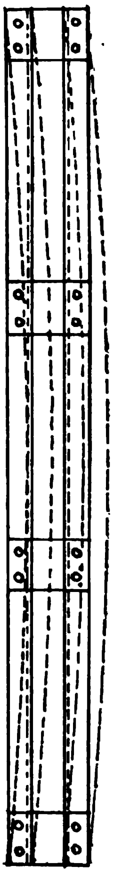


Fig. 1.

dicate how this member could bow in failing and show very clearly the futility of the end gusset plates in holding the axis of these channels rigidly in line, as they would have to do if the member were fixed ended or square ended in fact. The member had no lattice, the channels being merely held in line by the batten plates.

Another feature of this column was the use of batten plates with the idea that these shortened the unsupported length of the individual channels; as though one weak member could support another equally weak member by being connected thereto by a batten plate, which would allow both to deflect sidewise without interference. Here is another exceedingly vital point of design upon which books are silent. A compression member must be capable of taking transverse shear. It is an elementary engineering principle that a rectangular system, such as the battens and channels, cannot take shear. Lattice bars and the channels form a triangular system, which can act as a truss to carry the transverse shear of a column.

In Engineering News, July 6, 1911, there is a description of a gasholder post which failed in Hamburg, Germany. This post was made up of two little 5-in. channels and a few pairs of little tie plates or battens that could be carried in a man's coat pocket, and it was expected to carry a load of 133,000 lbs. A leading European authority who investigated the wreck and the design reported that "the use of the tie-plated columns, when the section is assumed to be integral may lead to constructions which do not afford adequate security under loading of unusual character."

Fig. 2 shows a sketch of this column and how and why it could bow under endwise compression. In a letter in "Engineering News," July 27, 1911, the writer pointed out the fact that the probable ultimate strength of the column, worked out theoretically, is just about the amount of the load under which it failed—the load that was supposed to be the safe load. But this ultimate load, as the writer worked it out, was not figured on the basis of the standard book method of designing posts.

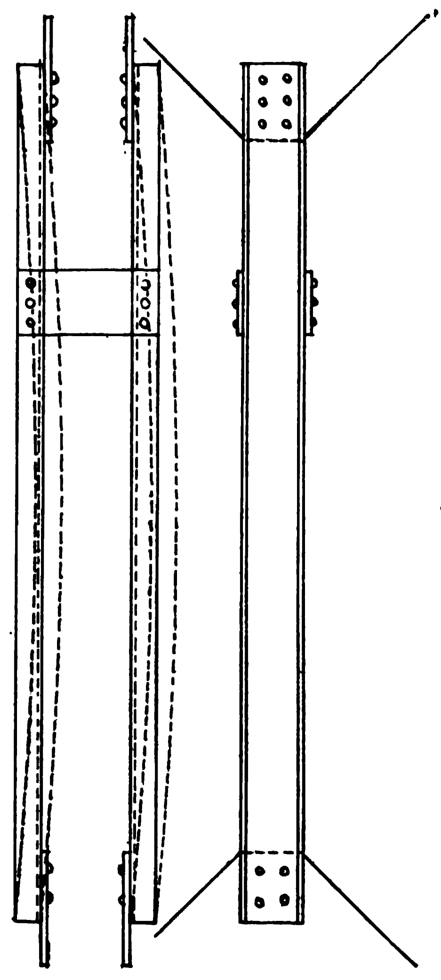


Fig. 2.

The writer points out, in this letter, the fallacy of applying Euler's formula to short columns, as the designing engineers had done; for they supposed the pair of channels would be united as an integral column by the tie plates, thus making the column a short one. He also points out the error in depending on tie plates to unite the parts of a column. The Euler formula gives the ultimate load of a column—the load which could not possibly be exceeded by any column, no matter how great the compressive strength may be; but in short columns, that is, columns having a ratio of slenderness of 100 or less, structural steel will fail in compression or crushing before the springing or bowing action can come into play. Tie plates do not hinder the bowing action of a column such as this one except in an inconsiderable degree. Because of the absence of lattice these two channels can bow together, and the ratio of slenderness of the column is the full length of the column divided by the least radius of gyration of a single channel. In this post that ratio was 180.

The writer's contention in the letter above referred to was disputed by a German engineer, in a letter published in "Engineering News," Sept. 28, 1911, and this was answered by the writer in the same issue. The claim is there made that because the tie plates would have to take the shape of oblique parallelograms by the bowing of the column as shown in Fig. 2, these tie plates would resist such bowing. The argument of the writer's reply will be repeated here.

These small two-rivet plates can scarcely add any rigidity to a column carrying more than 100,000 lbs. except in the immediate vicinity of the plate. Of course, in a greatly exaggerated sketch the parallelogram formed by the four rivets of the tie plates would appear to be greatly distorted. The same might be argued if only one rivet connected the tie plate and channel, since friction would resist rotation. Rivets are subject to slip, sometimes under small stress, and an exceedingly minute slip would allow all the rotation necessary for the column to assume the dotted position of Fig. 2, for a slender column has reached the point of ultimate failure at the first measurable deflection, if it be originally straight.

A slender column whose parts are perfectly straight may reach its ultimate load when it has deflected 1/16-in., or less, whereas a similar column with an original bow of ⅛-in. will stand an additional deflection of ⅛-in. before it fails, both columns failing at the same load. These are facts very easy to demonstrate mathematically on the theory of flexure, but very difficult to find in literature on the subject. It is such facts as these that ought to be written into the literature of engineering to displace a lot of mathematical nonsense in the way of complex and meaningless column formulas, based on impossible assumptions, which totally ignore the practical work of manufacturing a column. Such facts as these would go a long ways toward intelligent design of columns. Such emphasis of the importance and magnitude of slight deflection or bowing in a column has more weight than an abstract dissertation on the impossibility of a rectangle, assuming the shape of an oblique parallelogram.

There is a great difference between holding 40 inches of a column straight with a leverage of 3 inches (the distance assumed between two rivets of a tie plate) and holding that length of a column straight by a triangular system of lattice. In the column under consideration, in 40 inches of length (the space between tie plates) one tie plate has the work to perform that in a latticed column would be done by 10 or 15 lattice bars. All of these lattice bars would be acting

to resist the bowing of the column, and all of the 20 or 30 rivets aid in relieving the individual channels of the bending which they would have to take, in addition to direct stress, in the tie-plated column.

The failure of a sprinkler tank support is described in "Engineering Record," Aug. 13, 1910. On four columns consisting each of 4-4"x3", 9.3-lb. Tees, held at intervals of 21 inches by 6"x3"x ⅜" tie plates, a load of 22,000 gallons of water and two tanks was carried. The columns were 13'-9" high. The ratio of slenderness is nearly 200, and this load is not far from the ultimate load of the columns. Failure is, of course, a natural consequence of such construction.

MARSHALL NATIONAL BANK, MARSHALL, TEXAS.
Architectural Terra-Cotta: Federal Terra Cotta Co. Theodore C. Visscher, Architect.

THE 86TH STREET THEATRE, NEAR 3RD AVENUE, NEW YORK CITY.

Electric Contractors, Edwards Electric Construction Co. Thomas W. Lamb, Architect.
Switch Board and Panels: Metropolitan Electric Mfg. Co.
Star Expansion Bolts Used.
Rockwood Automatic Sprinkler Equipment.
Von Duprin Exit Fire Devices.
Evans' "Crescent" Expansion Bolts Used.
Newman Watch Clock System

STUDENTS' DETAILS OF CONSTRUCTION

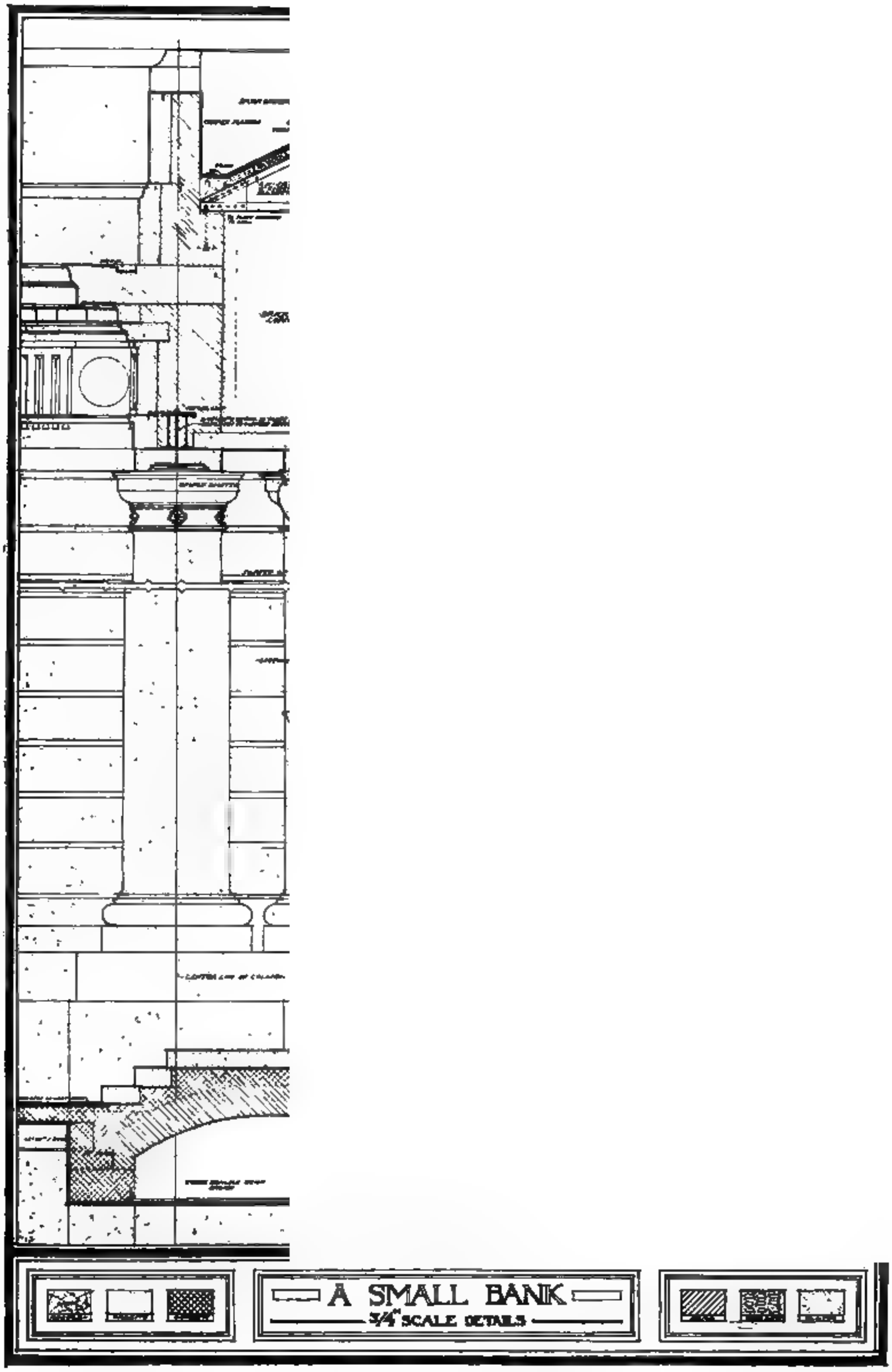
Architectural Department, University of Pennsylvania

SUPPLEMENTING the illustrations already published in recent issues, the drawings reproduced in the following two pages are selected from many examples of students' work in architectural construction in the School of Architecture of the University of Pennsylvania. The scales to which they were made were decided upon when the general plans, elevations and sections were determined. The problem involved, in general, all scale and detail drawings necessary to fully show the construction, and all calculations necessary to determine structural strengths and details.

The first drawing shown in this issue illustrating students' work in architectural construction as it is related to design problems, shows a small bank building with a one-half transverse section from the footings to the roof truss and a larger detailed section through the front façade of the building. The problem in design called for a bank to be erected on a plot of ground facing a public square and bounded on the sides by streets of minor importance. Another building adjoins the bank on the rear. The dimensions of the plot of ground are 40 feet facing the square and 80 feet on the sides, the plot being rectangular. The rooms which the bank is to contain were then enumerated in the program and the usual details for the problems in design explained to the students of the course.

The detailed drawings connected with the problem of constructing this building and belonging to the course in architectural construction co-ordinated with the course in design, show the various materials, their supports, anchors and ties, the outside and inside finish, the front entrance door and steps from grade, front window, the truss work, the solid-balustrade coping, the heavy stone entablature and its method of support and tying, the fireproof flooring, the decorative ceiling, etc.

The second illustration is a portion of the design of the façade of a fraternity-house, with the details for the same. This problem comprised the designing of a fraternity house for a college society at a great university. The building was to be located on a plot 200 by 300 feet, level, and having one side only bordering on an avenue. The materials and style were left entirely to the choice of the students. The drawings show the portion of the plan, drawn originally to 3/16-inch scale, and just above it the elevation of a portion of the façade with one of the bays in the first story, the triple window in the second and the curved-roof feature above. The larger drawings showing the details are drawn to ¾-inch to the foot. This student submitting this solution has chosen brick for the body of the building, with stone and concrete trimmings, a key to the materials being given on the drawing. The outside and interior finish are shown in detail, and also the construction of window sills, jambs, heads and mullions, the special design of fireproof flooring, the terrace in front of the bay, the roof copings and a portion of the roof construction.



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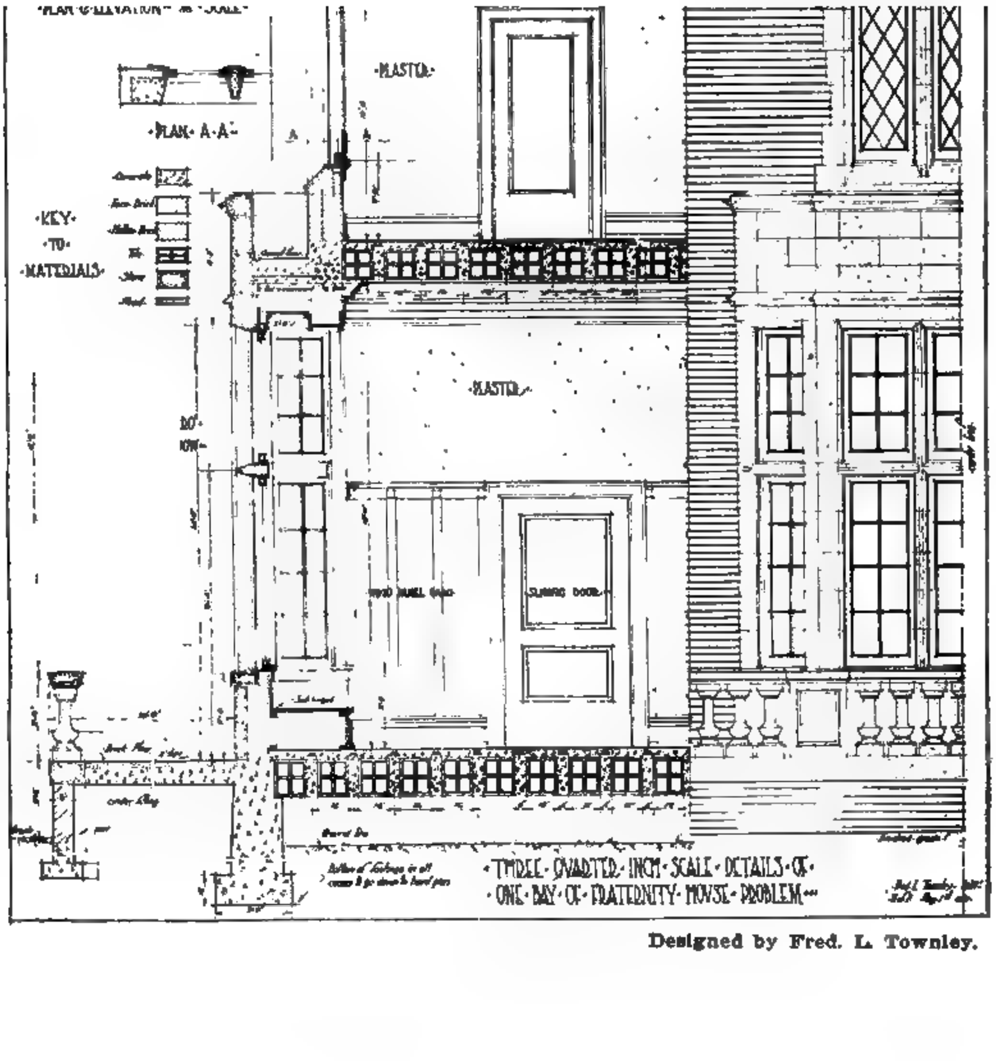


Designed by Fred. L. Townley.

'PERSPECTIVE OF SCHNEIDER-ANDERSON BUILDING, 16-18 EAST 46TH STREET. NEW YORK CITY.

Builders: Thomas J. Steen Co. Hazzard, Erskine & Blagden, Architects.
Corbin Hardware.

STANDPIPE AND HOSE SYSTEM IN BUILDINGS

Being Portions of the Report of the Committee on Standards of the National Fire Protection Association.

PART II.

W. C. ROBINSON, Chairman

THIS second portion of Mr. Robinson's report dealing with the equipment of hose stations follows in direct sequence to the portion previously published in our July issue.

EQUIPMENT OF HOSE STATIONS.

The character of the equipment at hose stations is governed by the class of service to be supplied, and in some measure by the class of building in which the standpipe and hose system is to be installed.

HOSE.

Generally speaking, all fire hose stored inside buildings should be approved unlined linen hose, on account of its greater durability and reliability in such localities. Linen hose also has the advantage of being lower in cost than good hose containing rubber. Its chief disadvantages consist of the relatively high friction losses due to the rough interior, its greater tendency to kink when handled, and the fact that it is not absolutely water tight when water is first turned on. These disadvantages are more than offset by its lightness and the comparative ease with which it can be handled, the fact that it can be stored in small compass, and, most of all, by its very materially greater durability as compared with rubber or rubber-lined fire hose in the heated dry atmosphere usual inside buildings.

Cotton rubber-lined hose may be advisable in some localities, but only where moist atmospheric conditions prevail and at roof hydrants and outside stations forming part of the standpipe system. Rubber hose should only be used in localities where hose fabrics are quickly destroyed by the action of chemicals.

Hose stations provided with equipment to be used by the occupants of the buildings should each be equipped with 1½-inch hose not exceeding 50 ft. in length, and with a conspicuous permanent sign calling attention to the purpose for which this hose is provided. At upper stories and where the initial water pressures are low, the use of 2-inch in place of 1½-inch hose may prove advisable.

Hose stations intended for use by Fire Departments or those trained in handling heavy fire streams should each be equipped with a 2½-inch hose not exceeding 100 feet in length. A conspicuous permanent sign should be placed at each station, calling attention to the fact that the 2½-inch hose is only to be used by the Fire Department or several persons trained in handling it, and that smaller hose is provided for use by occupants of the building. The present general practice of equipping standpipes with 2½-inch hose only is often a menace to life on account of the inability of inexperienced persons to handle it, and in most cases; affords no protection during the incipient stages of fire for the same reason.

In most cases it will probably be found convenient and advisable to provide both sizes of hose at the stations supplied by the larger standpipes.

HOSE RACKS.

All hose should be attached to valves at the standpipe and stored on approved racks of substantial construction securely fastened in position. Hose racks of the swinging type are the most reliable under ordinary conditions, although special claims are made for other types which are apparently in some measure justified. For 2½-inch hose, which can only be effectively handled by several persons, there does not appear to be any necessity for racks which are automatic or partially automatic in operation. Racks for such hose should be so designed that the hose can be quickly laid by those at the nozzle, without danger of its dropping to the floor in a tangle as it is pulled from the rack. Water should not be turned into 2½-inch hose until it is laid and the signal is received from those at the nozzle.

The 1½-inch hose should be stored on racks of the same general type, so designed that the water can be turned on without disturbing the hose or preventing it from being pulled off and laid without further attention to the controlling valve. Racks of this character have the advantage of being easily operated by one person and are sufficiently automatic in their action. If properly designed and constructed, they are reliably operative under pressures somewhat in excess of 125 pounds, and when the water is turned on before or after the hose

has been removed from the rack. The valve difficulties almost always accompanying the automatic reel or rack are eliminated in these racks.

HOSE VALVES.

Particular attention should be given to the selection of the hose valves located at the standpipes. A variety of such valves is available, but it is probably difficult to obtain in one valve all of the features which may be desirable for the various conditions of service. A hose valve should have a straight, full, unobstructed waterway through it, should open easily and quickly to the full open position, should be absolutely tight against high pressures when closed, should be difficult to accidently disturb and cause leakage, should be provided with an open drip to take away slight leakage and prevent water from entering the hose, should be compact and neat in design and appearance, substantial in construction, and capable of withstanding without leakage all reasonable stresses to which it is subjected.

It is questionable whether any hose valve now available fulfills all of these requirements to a sufficient degree to warrant its unqualified approval for all classes of service. It is also possible that all of the above qualifications are not essential under some conditions, particularly where the water pressures are comparatively low. Hose valves are expected to prevent leakage into the most perishable part of the equipment and remain in a reliable condition for indefinite periods of time without excessive maintenance, costs or trouble in localities where they are liable to be molested. All things considered, the best valve obtainable will probably prove to be the most economical.

Hose valves should be placed below the hose which is attached to them and within easy reach. If they are liable to be molested they should be provided with guards which are sufficiently secure to prevent tampering but which will not prevent access to them in case of fire. The 2½-inch valves, together with the hose couplings, should be provided with hose threads interchangeable with those of the Fire Department.

PLAY PIPES AND NOZZLES.

All 2½-inch hose should be provided with approved Underwriters' play pipes having a nozzle with 1⅛-inch discharge orifice. As this hose is for the use of those trained in handling heavy streams, each system should be supplied with a number of extra nozzles of larger diameter so that heavier streams can be obtained if desired. The extra nozzles should fit the Underwriters' play pipe, but the size of the larger streams likely to be required will depend on circumstances and should be determined by the Fire Department officials. One or more special nozzle holders should also be supplied where the heavier streams are to be employed.

A standard 1⅛-inch nozzle will discharge approximately 250 gallons of water per minute if provided with a constant water pressure of 45 pounds to the square inch. Streams from such nozzles have an effective reach of approximately 70 feet horizontally and 77 feet vertically in still air. On the interior of most buildings the effective reach of such streams is probably materially less than the distance given on account of obstructions and the inability to elevate the stream without striking the ceiling. The distances given will be materially reduced by the presence of wind when the streams are used on the exterior of buildings.

1½-inch hose should be provided with composition metal play pipes having a discharge orifice not less than ½-inch nor more than ¾-inch in diameter. The play pipe should be at least eight inches in length, tapered, machined to a smooth finish on the interior and provided with a heavy outside bead at the discharge tip to prevent injury in service and consequent disturbance of the stream. A short, well-made play pipe without swivel handles can be safely handled when used with 1½-inch hose. The small streams are not accompanied by a heavy reaction and the hose can be easily held and managed by any able-bodied person even at fairly high pressures.

A ½-inch nozzle will discharge approximately 32, 51 and 72 gallons of water per minute at 20, 50 and 100 pounds pressure at the base of the nozzle, respectively, but the effective horizontal and vertical reach of such streams has not been determined so far as could be ascertained. A ¾-inch stream will discharge 73, 116 and 164 gallons per minute, respectively, at the above pressures, and has an effective reach of 32 feet horizontally and 37 feet vertically in still air at 20 pounds nozzle pressure.

The vast majority of the play pipes now used for the equipment of standpipes are cheap, inferior and poorly suited for the purpose. They are most always highly polished on the exterior and rough and unfinished on the interior. Those used in connection with 2½-inch hose are often provided with small discharge tips and furnish streams easily furnished by smaller hose.

Inferior play pipes furnish inferior fire streams and have considerable influence on

the attitude of Public Fire Departments toward private standpipe systems.

PRESSURE REGULATORS.

One of the most serious problems in the design of standpipe systems for high buildings is that of reducing the pressures in the lower stories to a point where the hose streams can be safely and efficiently handled. Nozzle pressures in excess of 65 pounds render the larger streams difficult and dangerous to handle, even by trained men, and nozzle pressures in excess of 100 pounds make it practically impossible to use such streams for this service. While it is probably possible to handle the smaller first-aid streams at somewhat higher pressures than the larger streams, the pressures should not exceed certain limits if the best results are to be expected from those untrained in handling fire streams.

A number of methods of accomplishing the desired reduction of the pressures in the fire hose have been tried with indifferent success. One method involves the use of several tanks at different elevations in the building, the standpipe being so connected that each tank will supply the hose on a limited number of stories only, and excessive gravity pressures thus avoided. This method necessitates the use of considerable valuable floor space, is expensive on account of the duplication of tanks, and loads, and necessitates complicated pipe connections to the water supplies. It fails to accomplish the desired results at lower stories, when the pumps or auxiliary sources of water supply are in use.

The use of special pressure reducing or regulating valves at each hose station has been attempted, but it is understood that the valves thus far tried have not been wholly successful. This method involves the use of numerous mechanical devices, the operation of which is more or less uncertain, complicates the pipe connections and is expensive on account of the cost of the valves.

It is well known that excessive pressures in fire hose attached to high-pressure water supplies can be avoided by only partly opening the hose valve and limiting the amount of water which enters the hose; in other words, by establishing the ratio between the size of the inlet and outlet which will result in the reduction of the pressure to a point where the stream can be safely and effectively handled. Unfortunately, it is impracticable and unsafe for those who operate standpipe systems to try and obtain the proper reduction in the hose pressures by the manual adjustment of hose valves at time of fire, and some reliable means of automatically accomplishing the desired result must be provided. Your committee is advised that recent experiments in New York have shown that the use of a metal disk placed in the coupling at the inlet side of the hose, and having the proper size of orifice through it, will probably give satisfactory results for the smaller streams.

The experiments have been made with disks having orifices from 9-16 to 1 inch in diameter, under standpipe pressures as high as 165 pounds, and with 50 and 100-foot lengths of 1½-inch linen hose provided with a ⅝-inch smooth-bore nozzle. It is highly probable that by this or similar means the desired results can be obtained for all sizes of hose streams under all conditions of service.

DRAINS.

Each hose valve should be provided with an open petcock arranged to discharge any leakage past the valve into an open drain pipe. The system of drain pipes should be large enough to carry off the water while the petcocks are discharging under pressure, should be rigidly installed and connected to the sewer or other convenient place for the disposal of the water. The discharge of water from the larger drains with which roof hydrants or monitor nozzles are provided should be taken into consideration in determining the size of the main drain pipes.

ROOF HYDRANTS AND MONITOR NOZZLES.

Roof hydrants should be equipped with 2½-inch hose and Underwriters' play pipes having 1⅛-inch discharge. When the hydrants are located in roof houses where there is no danger from frost, the usual hose valves can be employed. When they extend through the roof and cannot be protected from frost, the water should be controlled by gate valves under the roof, and the hose stored in ventilated metal or metal-clad hose houses. The gate valves should be operated by rods extending through the roof and provided with drains so arranged that they will automatically drain the hydrants when the water is shut off.

Monitor nozzles will usually be exposed to freezing and the water should be controlled by gate valves located under the roof, similar to those described for roof hydrants which are subject to frost. As these nozzles are usually employed to furnish heavy streams in commanding positions and are intended for use by trained firemen, and as the size of the stream is largely governed by conditions of exposure, Fire Department officials should be consulted before their installation.

ADAMS EXPRESS COMPANY BUILDING, A PORTION OF THE GRAND CENTRAL IMPROVEMENT AT 49TH TO 50TH STREETS AND LEXINGTON AVENUE, NEW YORK CITY.

Warren & Wetmore } Associated
Reed & Stem } Architects

Architectural Terra-Cotta: Federal Terra-Cotta Co.
Painting and Decorating: Peter McKay, Inc.
Chicago Triplex Butts and Hinges.
Evans' "Crescent" Expansion Bolts Used.
Grant Overhead Sash Pulleys Used.

THE MASONIC HALL BUILDING, NEW YORK

OF FIREPROOF AND FOOLPROOF CONSTRUCTION

H. P. KNOWLES, Architect

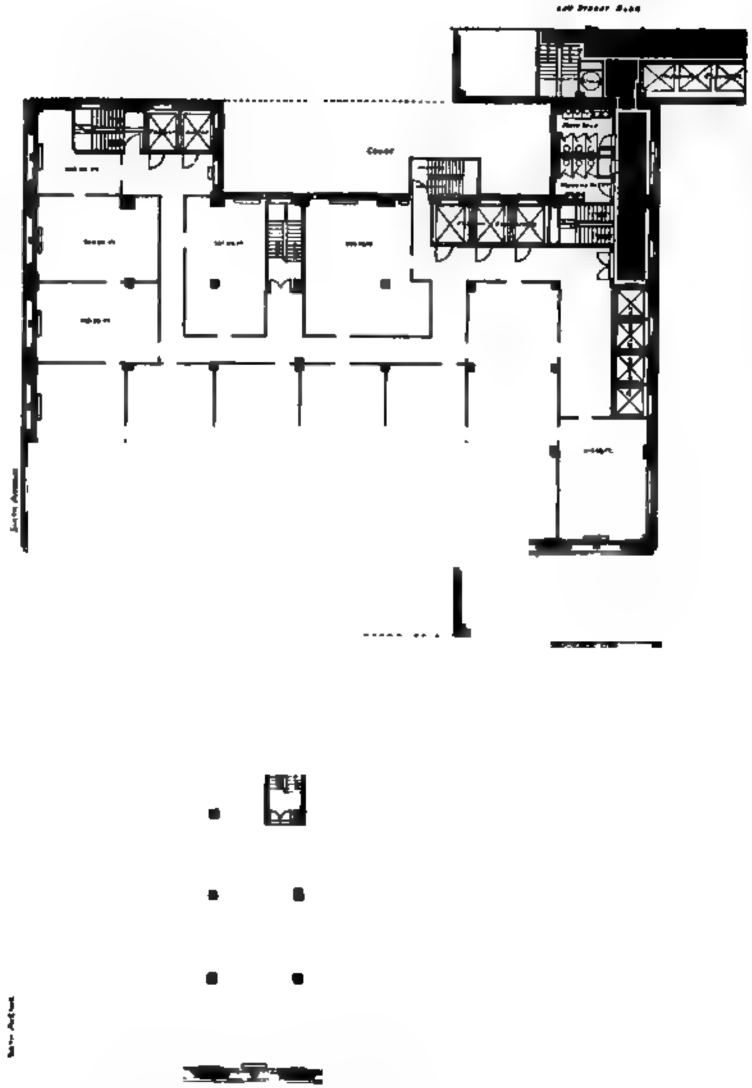
A BUILDING in itself non-combustible and figured to prevent the combustion of its contents from whatever source as fully as possible, as well as being so designed as to be nearly foolproof in case of a panic among numerous employees, has been erected on the corner of 23rd Street and Sixth Avenue the site long occupied by the old Masonic Temple. The building is known as the Masonic Hall Building and it adjoins and is connected with the Masonic Hall which faces on 24th Street. That it is a part of this building is felt more than seen, as we view it from the street. While it is distinctly a loft building in its appearance, its materials reveal its relation to its more elaborate and beautiful sister. To express the purpose of the Fraternity building, Mr. Knowles has given us on 24th Street an elaborate façade which tells us, in a way, of the arrangements within and defines the purpose of the building.

Using the same blood and bone, limestone, tapestry brick and terra-cotta, on the 23rd Street corner, we behold the plainer if more stalwart structure. In construction the building is steel framed with a floor system of 12-inch terra-cotta arches of about 5-foot span. The trim throughout the building is fire-resistive, and it may be said that the only piece of wood that entered into the construction was the hand-rail of the main stairs. All doors are hollow steel and all the court and side facing windows are hollow metal glazed with wire glass. The street facing windows are kalameined, glazed with plain glass. The floors are concrete surfaced, and the interior wall finish throughout is plain plaster.

A comparison of the two plans which show divided and undivided stories, shows that the elevator and stair halls are accessible readily from all portions of the floor. There are four passenger elevators and five freight elevators, and there are four flights of stairs, all of which are enclosed in fireproof halls shut off from each floor by a swinging fire door. There are 19 stories to the building. The ceiling heights are 11 feet in the clear and the floor areas approximate 14,000 square feet.

The inner court which is lined with light-face brick, contains a stairway of interesting construction. It is entirely built of iron and is enclosed in an iron and wire-glass partition. It is entirely

BULLETIN BOARD FOR THE LODGE ROOMS IN THE 23RD STREET ENTRANCE.
Bulletin Board: U. S. Changeable Sign Co.



TYPICAL OPEN AND DIVIDED FLOOR.

Builders: George A. Fuller Company.
Fireproof Doors and Windows. Leonard Sheet Metal Works, Inc.
Star Expansion Bolts Used
Newman Watch Clock System
Ornamental Iron and Bronze: The Winslow Bros. Co.

THE ENTRANCE ON 23RD STREET.
H. P. Knowles, Architect.

MASONIC HALL BUILDING, NORTHEAST CORNER OF 23D STREET AND 6TH AVENUE, NEW YORK.

H. P. Knowles, Architect.

Builders: George A. Fuller Company.
Copper Cornices and Roofing. Herrmann & Grace Co.
Grinnell Automatic Sprinkler Equipment.
Architectural Terra-Cotta: Federal Terra-Cotta Co.
Otis Elevators.

THE WIDE HALLWAY FROM 23D STREET AND THE BLACK FINISHED ORNAMENTAL IRON STAIRWAY NEAR THE ENTRANCE TO THE 24TH STREET BUILDING.

H. P. Knowles, Architect.

Marble: R. C. Fisher Co.
Elevator Doors: Leonard Sheet Metal Works, Inc.
Evans' "Crescent" Expansion Bolts Used.
Chicago Triplex Butts and Hinges.
Otis Elevators.
Ornamental Iron: The Winslow Bros. Co.
Corbin Hardware.

THE EXCELSIOR BANK OCCUPYING THE CORNER OF THE MASONIC HALL BUILDING.

Marble; Cork & Zicha Marble Co. H. P. Knowles, Architect.
Grinnell Automatic Sprinkler Equipment.
Grant Overhead Pulleys Used.

outside of the building and is entered from each floor by a swinging fire door which is opened by a push bar door lock so that the door is never closed from the inside. All other hallway doors are of the same swing type kept closed by spring door checks. The entrance between this new building and the previously built portion on 24th Street is through a public hall.

On every story there is a double set of fire doors, one sliding door and a pair of swinging doors, all held open on fusible links so that in case of fire they will immediately close, isolating the two buildings. This requirement was made so as to obtain the best rates of insurance on the new wing which is protected by an automatic sprinkler equipment.

Every portion of the new building is protected by automatic sprinklers, and this system which was put in by the General Fire Extinguisher Company, complies with the requirements of the Building Department and those of the Board of Fire Underwriters so that this building has the lowest possible rate of insurance for a building of its class. This sprinkler system is entirely fed by pressure tanks with provision for connection to the street service. There are no gravity tanks.

The entrance hallway is somewhat elaborately treated with panels of Skyros marble framed in grey Sienna. The walls are cream tinted above the marble wainscot, the elevator fronts are of bronze and the stair rail is of ornamental black iron. This hall has through connection to the 24th Street building and is exceptionally commodious for the type of building.

The corner of the ground floor of the building is occupied by the Excelsior Savings Bank which has a brightly designed banking room which is extremely attractive. The banking counter is of Breche Violette and Bottocino marble with grills of bright bronze. The floor is of marble mosaic, a finish which is used throughout the principal hallways of the building. The walls and ceiling of the bank are white with a banded decoration in gold.

The builders of the Masonic Hall Building were the George A. Fuller Company. The exterior architectural terra-cotta was supplied by the Federal Terra Cotta Company. The Herrmann & Grace Company did the copper cornices and roofing. The Leonard Sheet Metal Works, Inc., supplied the fireproof doors and windows.

In the main part of the building the marble was supplied by the R. C. Fisher Company, but in the bank the Cork & Zicha Marble Company did the marble work. The bulletin boards were installed by the U. S. Changeable Sign Co. The ornamental iron work was done by The Winslow Bros. Company. The total cost of construction slightly exceeded $1,000,000.

Mezzanine Floor

Main Floor

APARTMENT HOUSE, 36 CENTRAL PARK SOUTH, NEW YORK.

Painting and Decorating: Peter McKay, Inc. C. W. Buckham, Architect.
Corbin Hardware.

NUMBER 23 LAKE SHORE DRIVE, CHICAGO, ILL.
Marshall & Fox, Architects.

ELM STREET APARTMENTS ON LAKE SHORE DRIVE, CHICAGO, ILL.
Howard Shaw, Architect.

THE MUNSEY BUILDING, BALTIMORE, MD.

McKim, Mead & White, Architects.

Builders: Geo. A. Fuller Co.
Bulletin Board: U. S. Changeable Sign Co.
Otis Elevators.

Star Expansion Bolts Used.
Evans' "Crescent" Expansion Bolts Used.
Chicago Triplex Butts and Hinges.

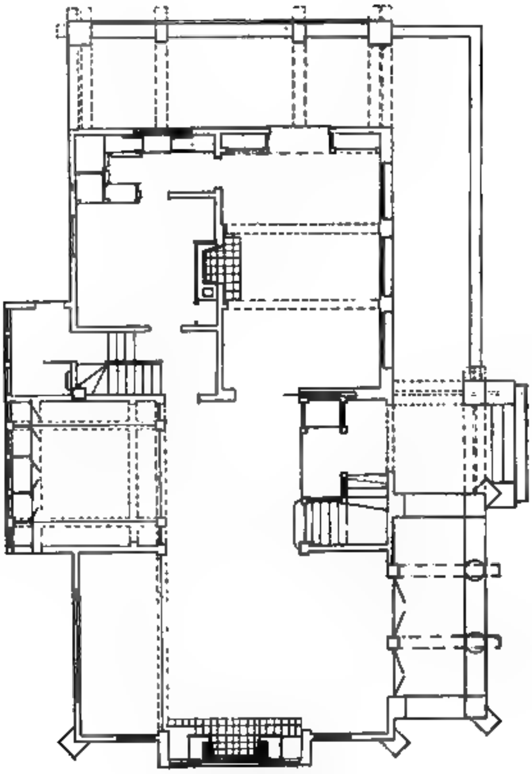
THE INTERIOR AND A DETAIL OF THE ALTAR, SAINT ANTHONY'S CHURCH, VAN NEST, NEW YORK.
N. Serracino, Architect.

SAINT ANTHONY'S CHURCH VAN NEST, NEW YORK.
N. Serracino, Architect.

A CALIFORNIA DWELLING

THE adaptation of the Swiss type of cottage is not uncommon in California at the present day, and in this building we see a very broad generalization of the Swiss châlet. Mr. C. W. McCall, the architect, has preserved only the general outlines. His treatment is very free, yet the spirit of the châlet seems present.

The house is of frame construction, covered with steel lath which carries three coats of cement plaster. The timbered effect is produced with undressed wooden battens stained a Van Dyke brown. The plan of the first floor is an open one adapted to a warm climate. The living room and hall have beamed ceilings and in the living room, opposite the opening from the hall, there is a great fireplace with ingle nooks. In the dining room there are built-in buffets and in the library there are built-in bookcases. It is stated by the architect that this house could be erected at the present cost of material for about $7,000 in southern California.



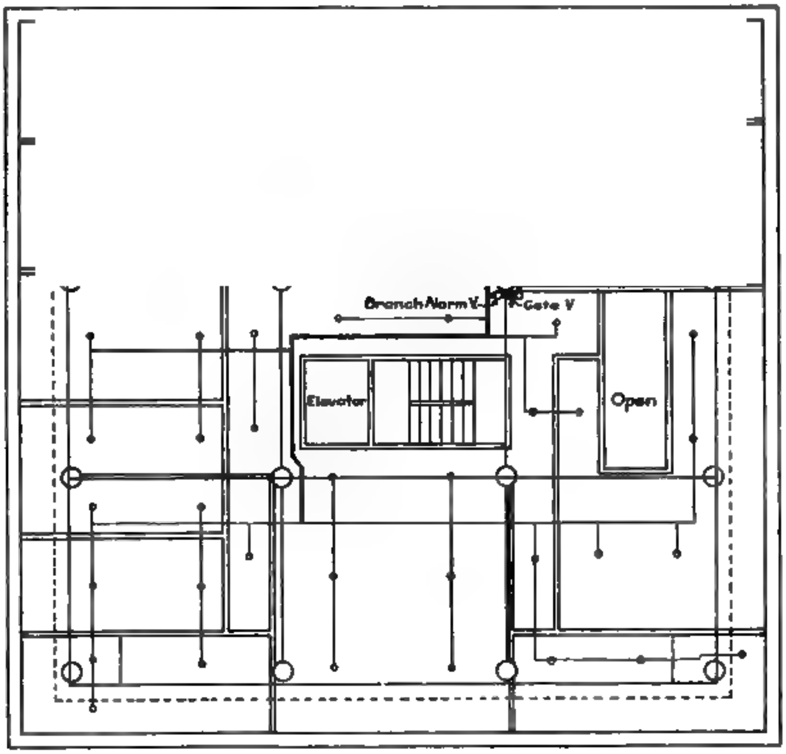
RESIDENCE IN OAKLAND, CALIFORNIA
FOR MR. OSGOOD.
C. W. McCall, Architect.

The Lofty Automatic Sprinkler Equipment of the Bankers' Trust Company

THE pyramidal top of the Bankers' Trust Company is fast becoming a familiar sight, and is passed over by the layman with the comment that it is intended as an architectural adornment and probably isn't used for anything. Such, however, is not the case. The entire interior of this surmounting pyramid is made use of and to the fire-protectionist it is one of the most interesting parts of the whole building.

The top level of the building rises 525 feet above the sidewalk and its basements extend 50 feet below. The building contains 38 stories above the street and 4 stories below. Throughout the construction the most recent developments of correct fireproofing have been employed, and everything that could be considered as a safeguard against fire in such a building has been made use of.

Within the pyramid at the top are included the 32nd to 37th stories, and these stories consist of a series of vaults wherein there are stored valuable papers and records of the Bankers' Trust Company. As to the vaults themselves, there is little to say, for in their construction there is no combustible material. However, the inflammable contents of papers and records might easily be destroyed within a vault at a very great loss,



BANKERS' TRUST CO.
Plan of the 33rd Story with the Exception of the Upper Right Hand Corner Where the Plan Is of the 32nd Story to Show the Sources of Water Supply.

and to provide against this contingency an automatic sprinkler system has been installed in the six stories mentioned.

This sprinkler equipment is unusual in that it is undoubtedly situated at the highest point in any building in the world. It furnishes protection to property at a height at which the fire department would be absolutely helpless working from any external source. The plan given shows the sprinkler system as installed on the 33rd story. As the stories ascend they decrease in area because of the pyramidal form of the structure which consequently reduces extensively the area in square feet per floor as we reach the top. The following list gives the number of Grinnell automatic sprinkler heads on each story.

32nd floor	35
33rd "	49
34th "	40
35th "	20
36th "	13
37th "	6
Total	163

The installation of the pipes and the placing of the heads follows the usual regulations for such work, and the interest centers more in the source of supply, as it is no small problem to maintain and continue a sufficient supply of water at a point around 500 feet above the surface level. The supply may be said to come from three separate sources. First, there are two 1,250-gallon, steel pressure tanks, one of which is located on the 32nd floor and the other on the 37th floor. In the upper right hand corner of the plan given is shown a portion of the 32nd story which contains one of the pressure tanks. There is also shown in the plan the riser which furnishes the supply from the surface levels. These two pressure tanks will exert a pressure on the sprinklers of at least 75 lbs. to the square inch.

The second source of water supply to the sprinkler system comes from the high pressure pumps of 250 gallons per minute capacity each, which are located in the sub-basement and take their supply directly from the city mains.

The third source of supply may be said to be an auxiliary emergency source and consists of a Siamese fire department steamer connection outside the building at the street level, to which the fire department can connect a steamer and pump from an outside hydrant connection a sufficient volume of water to directly supply this lofty sprinkler system.

This is to our knowledge the first time that an automatic sprinkler equipment has been installed in a building for the primary purpose of protecting valuable papers and records stored at so great a height, and it is a proof of the growing reliance placed in sprinkler systems for the checking of a fire at its inception that this system has been installed. The General Fire Extinguisher Company, who installed this system, believe that an automatic sprinkler system will give the best possible protection for such purposes and that the initiative of the Bankers' Trust Company in thus equipping their building will be followed by other builders in the future.

AN INTERESTING CHIMNEY PROBLEM

IN the study for the new Engineering Hall of the Carnegie Institute of Technology which is situated in Schenley Park, Pittsburg, a very interesting solution of an architectural problem is presented. The architect, Mr. Henry F. Hornbostel, realized that the large stack which is a necessary requisite of a power house, would be extremely offensive amid the surroundings of a fine group of well-designed buildings and the picturesque scenery of the park itself. To avoid this incongruity the solution shown by the model was developed. This building includes a power house and the Departments of Mechanical and Electrical Engineering of the School of Applied Sciences. The topography of the site necessitated the placing of the front entrance of the building two stories above its lowest level, and this is shown by the model. This building is of great importance in the group architecturally, as it is placed at the lower end of the main axis of the central court. It is, moreover, the first building to be seen from the entrance to the park, and in a sense it forms a façade at this point for the whole group.

The development of the chimney into a huge central tower with a conical top, which is flanked on either side by the wings occupied by the two technical departments, gives a monumental silhouette. An inside steel stack goes down through the center of the tower opening directly

DESIGN FOR THE NEW MACHINERY HALL, CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURGH, PA.

Henry F. Hornbostel, Architect.

above the boilers, and about the stack the main stairways have been developed.

The Mechanical and Electrical Departments of the School of Applied Science were combined with this building because of the facilities for study which the power house itself afforded to the students.

The question of vibration from the engines affecting the delicate machines of the Electrical Department arose, but this was overcome by going down with their foundations to a lower stratum of rock and packing them around with sand, so that there should be no more vibration in the upper part of this building than would be occasioned by engines in any buildings in the vicinity.

THE AUTOMAT RESTAURANT

THIS new restaurant which is located on Broadway, near 47th Street, has a very interesting façade of terra-cotta and ornamental glass. There are three floors, basement and sub-basement. The basement, first story and the upper stories are all used as restaurants. The plan shown of the ground floor is more or less typical of the arrangements elsewhere. In explanation of the operation of the restaurant, the interior is open, there being only a central column up through the building to break the floor space. Tables are furnished about the interior and the automatic serving machines are located along the back and one side wall. The customer on entering, goes to the cashier if he wishes to make change, and then proceeds to the machine. For ordinary viands the proper coin is deposited in the slot and a turn of the knob throws open a little door and within the compartment which is exposed the food is found. Spaced about the interior are small tables. The only waiters in sight are those who clear the tables of dishes and keep them clean. Behind the automatic machine is a space for serving and refilling the machines. Dumb waiters connect from this space to the basement kitchens.

AUTOMAT RESTAURANT, BROADWAY, NEAR 47TH STREET.

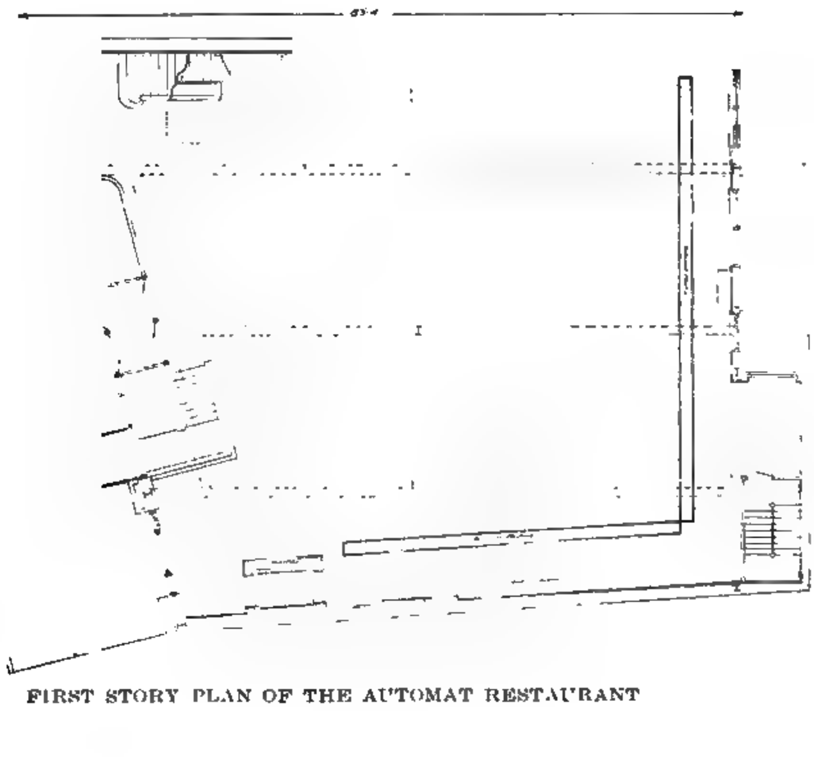
Stuckert & Sloan, Architects.

Plumbing Contractor: John Boyd Plumbing & Heating Co.
Evans' "Crescent" Expansion Bolts Used.
Corbin Hardware.

In construction, the building has brick exterior walls with structural steel framing for the support of the floors. The supporting columns are shown in the plan, and are of Bethlehem H. sections. The dotted lines in the plan show the girder and beam framing which consists of Bethlehem girder beams. The transverse girders consists of 30-inch, 180 lb. Bethlehem sections, while the longitudinal beams consist of 28-inch, 165 lb. sections.

There are three entrances, a centre one and one to each side. A stairway leads to the basement near the centre entrance, and a stairway leads to the upper floors near one of the side entrances. There is a stairway for service in the rear, and a large ventilating shaft in which the smoke stack is included.

The general contractor on the Automat Restaurant Building was Cramp & Company. The terra-cotta on the exterior was supplied by the Conkling-Armstrong Terra-Cotta Company. The ornamental glass of the front was supplied by D'Ascenzo Studios and the plumbing contractors were the John Boyd Plumbing and Heating Company. The refrigerating plant was put in by the Brunswick Refrigerating Company. Victor Goetz was the engineer.



FIRST STORY PLAN OF THE AUTOMAT RESTAURANT

(Advertisement Continued from July Issue)

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Using the Otis Inclined Elevator the man has only to load the truck, push it over to the ramp, *and the Otis Inclined Elevator does the rest.* The men with trucks and heavy loads are brought from level to level quickly, safely, and without physical effort. No time is wasted—no stops—no straining at the grade—no congestion—*the work goes on continuously.* Then as quickly as unloaded the Otis Inclined Elevator carries both men and trucks back for more freight. An electric motor is all that is required for operation and the current cost, results considered, is relatively small.

We make inclined and horizontal types adapted to every condition You should be interested in this better, faster and cheaper method. An investigation of the type adapted to particular requirements and the money and time-saving advantages effected will surprise you. Without obligation our Engineering Department will submit plans and furnish estimate on equipment and operating cost. Write to us Let us show you how to largely INCREASE capacity at DECREASED cost.

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Offices in all Principal Cities of the World

Steamship Dock, Railway Freight Station, and Warehouse Type

BOOK REVIEWS

ONE HUNDRED BUNGALOWS—Published for the Brick Association of America, by Rogers & Manson, Boston. Paper, 8x11 inches. Price, 50 cents.

This book consists of one hundred designs selected from 666 drawings submitted by architects and draughtsmen from all parts of the country in a competition recently conducted by the Brickbuilder. The cost of the brick bungalow was limited to $3,000 for the building. The illustrations show that there is no lack of competent draughtsmen to be found in this country, and the sketches are most pleasing to the eye as well as fulfilling the requirements of good construction.

The prize and honorable mention designs have been shown and it is the opinion of competent authority that all the designs presented can be built for the figure set, supposedly, however, within certain localities.

HOUSE WIRING—By Thomas W. Poppe, New York, Norman W. Henley Company. Price, 50 cents.

This little hand book contains 74 diagrammatical illustrations and descriptive text. It is a book for the practical workman, and shows wiring plans for a small house and illustrations of the various appliances and devices used in installing wiring for electric lighting in the dwelling. The book is of special value to apprentices, helpers and electricians.

HISTORY OF BRIDGE ENGINEERING, by Henry Grattan Tyrrell, C. E., published by the author. Cloth. Price, $4 postpaid.

This attractive subject has been treated exhaustively by the author. He has taken up the bridges of Egypt, Babylonia and Persia, the fine Roman arches of which some are still in service today, the Medieval bridges, some of which, in connection with their fortifications, required considerable engineering skill in their solution, Renaissance bridges which closed the ancient period and bring the reader up, in the author's classification, to the modern stone bridges beginning about 1750. In this chapter he treats of Blackfriar's Bridge, London Bridge, High Bridge and Cabin John Bridge, as well as others of equal renown.

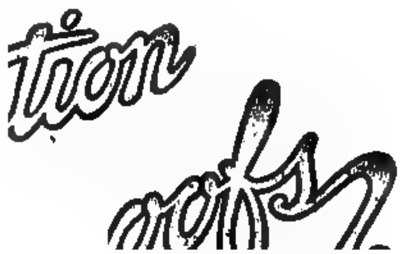
The illustrations of these bridges are some of the most pleasing of the book and one cannot help but feel that the product would have been greatly improved if the plates had been printed on wood-cut paper.

The succeeding chapters deal with pontoon, aquaduct, wooden and cast-iron bridges. These are followed by simple truss, tubular and plate girder bridges, suspension bridges, cantilever bridges, wrought iron and steel arch trestles and viaducts, solid concrete and reinforced concrete bridges.

Throughout many line drawings of the forms of construction are given, and also a considerable number of reproductions from photographs. In the chapter on cantilever bridges, the author does not confine himself to actual structures, but tells us of some of the mighty projects that have been conceived, such as the English Channel bridge designed to span the 21 miles that separate France from England, and others. The book throughout is certainly very entertaining, and will make an appeal to the layman as much as to the engineer. There is a fascination about a big bridge that few people can resist, and we believe that to many people Mr. Tyrrell's work will be as fascinating as a novel.

ARCHITECTURAL STYLES FOR COUNTRY HOUSES. Edited by Henry H. Saylor, New York. McBride, Nast & Co. Cloth. Price, $2 net.

The symposium gathered under the title of "Architectural Styles" consists of contributions which have appeared from time to time in "House and Garden." The book is prepared in the usual form of the publishers—a light but bulky book with broad margins, large type and good illustrations interleaved between. The series of little essays is written by some of our very well-known house designers, men whose names have become closely associated with the American home and its development. The styles considered in the book embrace most everything that we are apt to find in America and the book is one that should be most useful to a man or woman who desires to build a home. An architectural style that is in harmony with one's ideas is a most restful thing and is greatly conducive to one's peace of mind. We believe that this book should help the prospective home builder to choose well and with the conviction that when the home is built it will be satisfactory. The list of contents is worth while, for each little essay by a separate author is of equal merit and they should not be obscured under the general title. We give the list: The Colonial House, by Frank E. Wallis; Modern English Plaster Houses, by J. Lovell Little, Jr.; The Swiss Châlet Type, by Louis J. Stellman; Italian Adaptations, by Louis Boynton; Tudor Houses, by R. Clipston Sturgis; The Spanish Mission Type, by George C. Baum; The Half Timber House, by Allen W. Jackson; The Dutch Colonial House, by Aymar Embury, II; A Style of the Western Plains, by Hugh M. G. Garden; The Northern Tradition, by Alfred Morton Githens.


tion

Art and Architecture

NEW PRESIDENT OF UNITED STATES REALTY & IMPROVEMENT CO.

Wilson Sherman Kinnear, the new president of the United States Realty & Improvement Co., comes to New York with a reputation for doing big things. Mr Kinnear in his new position is the successor of H. S. Black, who, although retired from the presidency, is chairman of the board of directors and of the executive committee

Mr. Kinnear was born May 25, 1864, at Circleville, Ohio, the son of Richard and Mary (Crow) Kinnear. He attended the public schools, afterward entering the Kansas State University, where he remained from 1881 to 1883, later receiving the C. E. degree from the Board of Regents.

After leaving college, he entered the service of the Atchison, Topeka & Santa Fe Railroad as an axman on construction work and after that period served consecutively as rodman and draughtsman on construction, and levelman and transitman on location, for the Southern Kansas Railway From 1884 to 1885 he was rodman and assistant engineer on construction for the Kansas City, Clinton & Springfield Railroad, and in 1885 and 1886 was assistant engineer, maintenance of way, of the Missouri Pacific Railway at Kansas City, Mo., and succeeding this was, until August, 1887, division engineer and office engineer of the Gulf, Colorado & Santa Fe Railway.

From this period until January, 1889, Mr. Kinnear was in private practice in civil and hydraulic engineering at Los Angeles, Cal. Early in 1889 he was made office engineer, assistant engineer and acting chief engineer of the North & South American Construction Company, at Santiago, Chili, S. A., and a year later became assistant engineer, maintenance of way, of the Michigan Central Railroad, and retained ths position until April, 1895, when he was made supervising engineer on construction for the Toronto, Buffalo & Hamilton Railway at Toronto, Ont. Following this work he was, from January, 1896, to September, 1901, principal assistant engineer of the Michigan Central Railroad; until June, 1902, assistant superintendent, Canada division; July to September of the same year was assistant general superintendent; from September, 1902 to April, 1905, chief engineer, and was then made assistant general manager of the road He was also chief engineer of the Detroit River Tunnel Company and vice president of the Indiana Harbor Railroad.

In September, 1910, Mr. Kinnear moved to Kansas City, to become president of the Kansas City Terminal Railway Company, which position he retained until May 1, 1912, when he was elected president of the United States Realty & Improvement Company.

He is a member of the Whitehall Lawyers' and Sleepy Hollow Country Clubs of New York, the University Club of Chicago, University, Kansas City and Kansas City Country Clubs of Kansas City. He is also a member of the American Society of Civil Engineers and the Association of American Railway Engineers. He was married in 1887 to Caroline M. Nichols and has one son and a daughter.

In the report of the Art Commission of the City of New York for the year 1910, which is of but recent appearance, aside from the worthy efforts of that body in approving monuments of municipal significance, we find a very interesting little article on the restoration of the Borough President's office, which shows the restored room and some old engravings of it as it appeared in 1831 and 1868. The article gives a very interesting little bit of history and makes very entertaining reading.

CITY PLANNING CONGRESS AT DUESSELDORF, GERMANY, 1912.

Duesseldorf, the most beautiful and modern city in Western Germany, known as the "Park City," is at present holding an exhibition on City Planning, City Operation and City Administrative Functions, which will continue util October 31st.

The first group of exhibitions consists of general ground plans, traffic systems, such as railways, local and express facilities, elevated subway, suspension and street railways, aviation stations, city embellishment, bridges, docks, parks, lawns, forests, and real estate projects.

Under City Operation are grouped: Gas works, water works, electric central stations, sewage systems, street cleaning, refuse disposal, cemeteries and crematories

Under the third group, Administrative Functions, are exhibited plans and models of hospitals, rescue homes, poor houses, lodging houses, orphan asylums, homes for widows and the aged and infirm, schools, churches, museums, art galleries, libraries, concert halls etc.

It will be noticed from the foregoing items that this exhibition is planned with the well-known German thoroughness so that hardly any subject is omitted that is of importance in City Planning, City Operation and Administration.

OBITUARY.

Edmund M. Wheelwright.

After suffering for two years from a mental breakdown which developed in connection with his work as designer of the Hartford Bridge over the Connecticut River, Edmund M. Wheelwright, senior member of the architectural firm of Wheelwright, Haven & Hoyt, of Boston, died on August 15 at a sanitarium in Thompsonville, Conn.

Besides the Hartford Bridge, which cost $2,-000,000, Mr. Wheelwright leaves behind as monuments of his architectural skill the Boston Museum of Fine Arts, the Cleveland Museum of Art, and the new West Boston Bridge in Boston. He was 57 years old Mr. Wheelwright served two terms as Director of the American Institute of Architects.

ERRATUM.

In the July issue of Architecture and Building illustrations were shown of the Free Public Library in New Haven, Conn., Cass Gilbert, architect, and the City Library in Springfield, Mass., Edward L. Tilton, architect. In the text on page 292 a mistake occurred in the statement that Cass Gilbert was the architect, whereas Edwarad L. Tilton's name should have been given. Further, the name of William M. Green Company as engineers should have appeared under the illustration of the City Library building in Springfield and not below that of the Free Public Library in New Haven, Conn.

The William M. Green Company are engineers and architects, and are located in the Hitchcock Building, 318 Main St., Springfield, Mass. They were the engineers on the heating and ventilating of the Springfield Library.

Fireproofing and Fire-Protection

MR. G. H. STEWART

STILL BURNING.

According to the Journal of Commerce and Commercial Bulletin the loss by fire for the month of June, 1912, amounts to $16,103,450, which is a substantial reduction from the losses of $20,691,950 for the same month in 1911. The total loss for the first three months of 1912 was $80,905,950 which was a considerable increase over the figures for 1911 for the same period which were $69,907,250. The losses for the half year period of 1912 have reached the total of $134,417,750 which is higher than last year's figures for the same period which were $129,691,-750. Still, the losses for April, May and June show a general decrease and the losses for the half year are not far in excess of the same period last year. It can hardly be called a step in the right direction, however, and there is vast room for improvement.

The secret of reducing the national fire loss is not alone in the better building of new structures, but in the fireproofing and protection of the old ones. The possibilities of improving the condition of old buildings are far greater than might be supposed. The opportunity here offered for the enterprising architect in sensible alteration work is a large one and should offer a field through which he should be able to extensively increase his commissions.

THE NEWMAN CLOCK COMPANY AT HOME AND ABROAD.

The Newman-Munderloh Clock Company, Ltd., of No. 51 Victoria Square, Montreal, Canada, has recently been incorporated, succeeding to the business heretofore conducted by the Newman Clock Company in Canada and also to the business in watchmen's clocks conducted by Munderloh & Co., Ltd., of Montreal. There has further been organized the Newman Clock Company, Ltd., of No. 2 Whitechapel Road, London, E.C., and No. 55 Station Street, Birmingham, England, which will take care of the rapidly increasing demand for watch-clocks in Great Britain. These two new firms will maintain the standard of the products that are manufactured by the Newman Clock Company, of 178 Fulton Street, New York City, and 1526 Wabash Avenue, Chicago, who have been manufacturers of watchman's clocks for forty years.

FIRE WASTE AND ITS PREVENTION.

An article by Edward F. Croker, late fire chief of New York City, in the "Scientific American," contains the following self-explanatory statement:

"Every skyscraper and large city building must furnish its own fire protection, and all tools and appliances for city firemen, whose portable apparatus is useless above six or eight stories. There should be a complete system of automatic alarms and automatic sprinklers. The installation of an alarm system would have prevented the delay which cost the Equitable Building dear. Sprinkler systems, by which water is released automatically and an alarm given, are an invaluable aid and are essential where goods are stored.

"Building owners must be forced to supply all possible means of fire protection. Tenants should demand proper sprinklers and alarm systems. The extension of local alarms and sprinkler systems should be made compulsory, and greater restriction put on conditions of maintenance, with inspections more frequent and rigorous."

(Continued on page 26.)

The Device That Revolutionized Modern Fire Fighting

YOUR great grandfather fought fire just as the ancient Romans did. He formed a line—passing buckets of water from man to man—up a ladder and onto the roof. Half the water was spilled on the way, and half of the rest didn't hit the fire at all. The fire usually won.

YOUR grandfather fought it with a garden hose ; your father with a heavier hose ; and both had a fair measure of success. But here again half the water was spilled on the way—spilled against brick walls and chimneys. And lots more was used to break windows, in an attempt to search out the fire at long range

YOU don't fight fire that way—not if you are up-to-date. You use

YOU don't spill any water on the way—it all reaches the heart of the fire—and it puts the fire out. There are no windows to break—no chimneys or brick walls to drench—no passing of water from man to man. It all comes out of the sprinkler head and right where it is needed. There is no waste of water—and no waste by fire—for the fire always succumbs.

YOUR fathers paid large insurance premiums. You don't—if you have GRINNELLS. You pay only half as much as the other fellow. This difference pays for your sprinklers in four or five years—then it's all "velvet"

THAT'S why we said that GRINNELLS had revolutionized fire fighting—because they are fire fighters which put the fire out, instead of being put out by it—and because at the same time they form an investment returning 20 percent or more on their cost Soft, isn't it?

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Automatic Fire Protection

shows how the sprinkler system takes care of a fire—makes it commit suicide, in fact, by turning on the water which puts itself out. It shows how the sprinkler *prevents* large fires by putting out small ones. Write today for your copy.

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A FIRE IN THE BANKERS' TRUST CO. BUILDING.

In the basements of the Bankers' Trust Company Building there are two vaults which are at present equipped with automatic sprinklers. These vaults are intended for the purpose of storing waste paper, of which there is a large accumulation at the end of each day gathered from the bank. The purpose of these vaults was defeated in a rather unusual way by a fire which occurred in the evening of June 7 in a bale of waste paper in sub-basement C of the building.

Employees of the building, anxious to conclude their work for the day, failed to place several bales of waste paper in the vaults provided for the purpose and left them stored in the hallways before the elevators. The paper fire that was anticipated when the storage vaults were sprinkled occurred when the paper was elsewhere, with the result that the fire, spreading to several other bales of paper, caused such volumes of smoke to rise through the building that a fire of serious nature was anticipated and an alarm was sent in. The fire department made short work of it, however, with the use of the building standpipe system. We understand that a sprinkler equipment is now contemplated for these hallways in front of the elevators.

THE USUAL FIRE.

On August 17th, a fire occurred in a seven-story building at 731 Bleecker Street, New York City. The building was occupied by manufacturing firms and filled with merchandise, and the fire burned furiously, producing volumes of thick black smoke which made the fire difficult to fight and imperilled the lives of three firemen. Despite the high pressure system, little could be done in checking the flames, and the building is entirely wrecked with a loss estimated at $200,000.

If we must have fires, why not have a record like the following. We are publishing a letter which is quite self-explanatory.

January 12, 1912.

The Automatic Sprinkler Co. of America,
123 William Street, N. Y.

Gentlemen:—It may be of interest to you to know of the successful operation of our Au-

(Continued on page 28.)

tomatic Sprinkler Equipment this A. M., when a fire broke out in American Docks Store No. 11 protected by 200 sprinklers. This store contained over 4,000 bales of cotton, valued at about $200,000.

Now the advantage of the Automatic Sprinkler System is that only five of the 200 sprinkler heads went off, and although the building has a wooden roof, there was no damage to the building and no interruption of business, and I should say the entire damage is under $1,000.

Our entire plant is protected by about 12,000 automatic sprinklers, and this is the second successful demonstration of the effectiveness of your equipment. It is certainly gratifying to feel that our property is so well protected and I am very glad we were compelled some four years since to install automatic sprinkler protection. Yours truly,

AMERICAN DOCK & TRUST COMPANY,
A. B. Pouch, Vice-President.

FIRE BUCKETS AND FIRE BUCKET TANKS.

As great oaks from little acorns grow, so many a tiny blaze becomes a conflagration which, had there been a little forethought used and some small advance precautionary measures adopted, need never have attained serious proportions.

It would seem an absurdly simple proposition that every theatre, school, factory, shop and like places of public assemblage should be provided with fire buckets and plenty of them, and experiences have been many where the presence of a fire bucket at the right moment has resulted in a saving of many dollars and, what is infinitely more important, many lives.

The Safety Fire Extinguisher, a neat, compact tank containing a chemical solution which cannot freeze even at 20 degrees below zero, is extremely effective for this purpose. It is manufactured by the Safety Fire Extinguisher Company of 291-293 Seventh Avenue, New York City, which has attained a high place by the excellence of the product which their factories turn out. This firm manufactures also a superior type of fire bucket, and an attractive and very practicable Safety Fire Bucket Tank, or container.

It is said that 40 per cent. of the biggest concerns in the United States and Canada have installed Safety Fire Bucket Tanks, and that these devices are to be found in such important buildings as the Bankers' Trust Company Building in New York, the Christian Science Publishing Company, Boston, American Telegraph and Telephone Building, in Boston, the Lincoln Safe Deposit Company in New York and the Western Telegraph Building in New York.

An interesting descriptive booklet showing cuts of the various types of Safety Fire Ex-

(Continued on page 30.)

ELEVATOR SHAFT CONSTRUCTION

By H. ROBERT CULLMER
Assisted by ALBERT BAUER

Practical Suggestions for the Installation of Elevators in Buildings

A treatise for the architect and builder covering the surveying and preparing of detail drawings for elevator shafts; machine rooms; elevator bulkheads; tables and formulae for calculating the size and capacity of elevators; freight elevators; sidewalk elevators; dumb-waiters; specification writing for elevator installation; elevator shaft doors and appliances; building regulations covering elevator installation.

Cross Section of Elevator Shaft and Bulkhead.

Elevator shaft construction in buildings has never before been technically treated. This book supplies the demand for information on this subject, and it has been the effort of the author to supply the necessary data for the use of the architect in placing an elevator equipment in any building. New York practice is followed, and the Building Department laws and regulations of New York are made the standard. The author has also made a careful study of the regulations in use elsewhere, giving the deviations from New York requirements. Specification writing for elevator equipment has been covered by two forms; one a simple specification for a single elevator, the other a more elaborate equipment embracing several styles of cars suitable for an office building.

The book contains most practical information and it is the hope of the author that he has omitted no important point. Every phase of the shaft problem in building construction has been covered, and the method of presentation is such that ready reference is possible to any detail of the subject.

The book is in companion size with the **Building Construction and Superintendence** Series, by Mr. F. E. Kidder.

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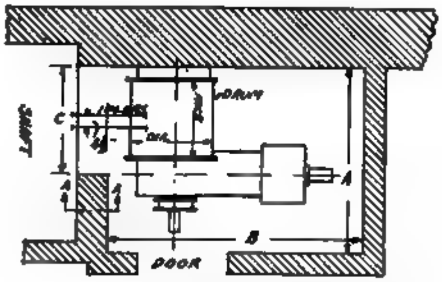


Plan of a Machine Room

tinguishers, Safety Fire Buckets and Safety Fire Bucket Tanks may be freely obtained by directing a postal to the Safety Fire Extinguisher Company, 291-293 Seventh Avenue, New York City.

The Globe Automatic Sprinkler Company, which is well known for their automatic sprinkler heads and the installation of automatic sprinkler equipments in buildings in the West, have recently opened a New York office at 47 W. 34th Street. Mr S. F. Weston is the Eastern manager. He is a well-known man in the sprinkler business in New York City and there is no question of his success. The works and general offices of the Globe Automatic Sprinkler Company are located at 1610-1620 Reading Road, Cincinnati, O.

THE ARCHITECT AND THE FIRE WASTE.

In an address before the Boston Society of Architects, C. M. Goddard lays particular stress upon the good work in bettering fire conditions which has been done and can be done by architects, working either individually or through their associations. He points out that the whole problem is based on the carelessness of the American people in taking a chance, and the love entertained by many for the almighty dollar. Only a few years after the Collinwood School disaster, Boston decided to change the school building requirements of strictly fireproof to sub-standard fireproof, because it cost too much to give absolute protection to the school children!

If we are to prevent conflagrations we must have better fire resistive construction. We must build so that fire departments may confine the fire to the building in which it starts. Inflammable roofs breed conflagrations through flying sparks and embers. Unprotected window openings allow the spread of fire from building to building. Frame sheds and outbuildings on otherwise fairly good structures carry the fire from one building into another.

To offset these various features the best internal protection, such as is afforded by automatic sprinklers, is a powerful adjunct, not

(Continued on page 36.)

Industrial Progress

THE INTERNATIONAL FLOOR MACHINE.

Perhaps no greater aid in the overcoming of numerous obstacles and small annoying details has come to the builder and building manager than that which came with the invention of the floor machine.

Prior to its invention, the surfacing and cleaning of all kinds of floors was extremely laborious and expensive from the standpoint of both time and money. With the invention of the floor machine a marked improvement was noticeable, but in the earlier types far from satisfactory results were obtained. As type after type of machine was invented, improvements of different kinds were attained, until the floor machine reached practical perfection in the invention of the type produced by the International Floor Machine Company and known as the International Floor Machine.

The International Floor Machine is a compact piece of mechanism, weighing 75 pounds, and capable of grinding 200 square feet per eight hour day. It is so constructed as to render easy of adjustment a wide variety of tools which enable it to perform very far reaching service. This machine is equipped with attachments for grinding, terrazzo marble, marble-mosaics and composition floors. Also an attachment for cleaning and scraping all classes of flooring. It renders fine service in removing old finish, sand papering and cleaning dance halls, bowling alleys and gymnasiums. It is equally effective in wax polishing and resurfacing marble and composition floors in hotels, clubs, municipal buildings, depots and apartment buildings. These facts will show the high character of service which can be obtained from the use of this machine.

Some very interesting literature, descriptive of the construction of this machine, the uses to which it can be put, and the economical and satisfactory results which can be obtained from its use, may be freely had by directing a postal of inquiry to the International Floor Machine Company, 39-41 West 38th Street, New York.

ARBITRATION RATHER THAN SUIT.

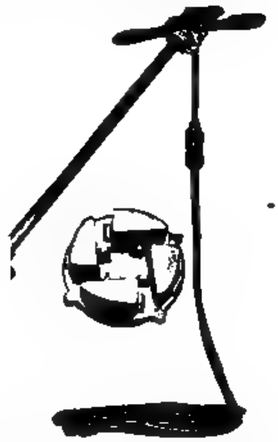
A recent editorial in the New York Times contains valuable information which we believe would be of advantage often in building disputes between any two of the three parties, the owner, architect and contractor.

"Do all business men who hire lawyers to settle their disputes know that the Chamber of Commerce of this city has a better method —better in every way, short, cheap, and fair? Mr. Sereno S. Pratt, Secretary of the Chamber, asked the National Association of Credit Men at their meeting in Boston the other day to inquire whether their clients had protracted suits at law, and whether their liquid funds were shortened on that account. Of course, every credit man should ask whether a person seeking credit is engaged in litigation, and, if so, why he does not try the more speedy and less expensive method of arbitration suggested by the Chamber.

"The Chamber of Commerce offers to every business man in this country, or doing business with it abroad, the facilities of its Committee on Arbitration, of which Mr. Charles L. Bernheimer is Chairman. The Chamber itself commands respect, the men composing its committee are picked men, judicial and practical, with large business experience. The fee paid to the arbitrators is purposely restricted to that of a referee, ten dollars a day. The hearings may be in private, and a dispute that the courts would protract for months or even years may be settled within a few hours.

"The voluntary arbitration, which becomes legal and binding, deprives the controversy of heat. Two of the biggest merchants of this city this year selected an arbitrator of the Chamber and submitted papers. Before the action could come to an issue they found that the points of difference were not great, and settled the dispute themselves. In this case the Committee on Arbitration served really as a Committee of Conciliation. Above all, resort to it overcame a disagreeable incident quickly, and at practically no expense."

(Continued on page 34.)



An examination will be held on September 11th and 12th to secure eligibles from which to make certifications to fill vacancies as they may occur in the position of engineering draftsman in the supervising architects' office, Treasury Department. Particulars and the places at which the examinations will be held may be obtained from the United States Civil Service Commission, Washington, D. C.

We note with interest that the tide is turning in building conditions in the city of Seattle. Last year to date showed only $4,513,935, while this year shows nearly a million more, or $5,498,315. These figures are inclusive of the month of July, and while the totals will not reach the high years of 1906 to 1910, the year's figures will undoubtedly be an improvement over those of 1911

Germany has appointed some twenty technical assistants to her consular service. Three of these men are working at present in the United States. It is their business to give German manufacturers timely notice of business opportunities and to answer questions relating to manufacturing and export trade This enables the German manufacturers to put in bids for work, send samples and establish agencies in an intelligent way without the large cost of exploring the territory themselves. It would seem that the United States might equally well equip its consular service with similar technical assistants who would do a similar service for American manufacturers and exporters.

The Merchants' Association of New York has again arranged for reduced fares, the last series of which on September 7th to 10th inclusive, may be taken advantage of by merchants and their representatives. The particulars of this reduced rate may be obtained by addressing the Merchants' Association. Briefly, it consists of purchasing a first class single trip ticket to New York on the dates given and obtaining from the ticket agent at the same time a return trip certificate which must be signed in the presence of the agent and countersigned by him. This certificate, with proper identification from a resident member of the Merchants' Association, entitles the holder to one-half return fare.

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(Continued from page 30.)

only in confining fires to the buildings in which they originate, but also in keeping them out of buildings having sprinklers, when they originate elsewhere. Reasonably small floor areas and protected vertical openings in floors are a great advantage.

No body of men is in better position than the architects to assist in the education of the public along the lines of better building construction. Many architects go abroad to study architecture in beautiful cities; on their return many of them use wood and shingles on buildings they design from what they have gathered abroad, in spite of the fact that such materials (as well as destructive fires) are practically unknown in the places they have visited.

LUMBER AND THE SOUTH.

At the recent forestry conference held in Nashville, Mr. Henry S. Graves, Chief Forester of the United States Department of Agriculture, spoke as follows:

"In any consideration of the industrial development of the South, the problems which stand out as most important are those connected with agriculture and forestry. The South is favored with climate and soil especially advantageous both for agriculture and for the production of forests. Its cut of lumber aggregates some twenty-four billion feet a year, or over half of that used in the entire nation. Other industries bring the value of the products of the forests to-day to upwards of 550 million dollars

"Louisiana now stands second only to the State of Washington in the production of lumber, while Mississippi, North Carolina, Arkansas, Virginia and Texas are all ahead of any other State. The lumber industry of the South employs some 217,000 persons, and the allied industries require over 200,000 more. We are dealing with a problem of gigantic proportions and one which touches the welfare of the entire nation.

"There is no region except the far Northwest where forestry is so simple and the results so sure as in the South. It is entirely practical to secure from the area which should be permanently in forest from twenty to thirty billion feet in the long run, by annual growth, if the forest is properly handled. Much of this area is in the mountains and the very management for timber production will secure the indirect benefits of the forest.

"The desired end cannot be accomplished at once. Our efforts must be organized. We must with all our forces, National, State and private, endeavor to overcome the fire menace. The public must aid in the matter of a uniform, consistent and sane system of taxation, while private owners must accept their responsibilities and handle their property in a way which will build up and not injure the interests of the State."

Residence W. C. Sanderson, South Orange, N. J.

This book gives a history of the progress of architecture from the early days of Colonial design in America, down to the present time, and will be found of interest to all desiring to study the subject consecutively Beautifully illustrated by many full-page plates giving examples of Colonial

ARCHITECTURE

AND

BUILDING

A Magazine
Devoted to Contemporary
Architectural Construction

Vol. 44 September 1912 No 9

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ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. SEPTEMBER, 1912 *NUMBER 9*

ARCHITECTURAL RESEMBLANCES

By J. L.

MICHAEL ANGELO said "Only an inventor can use the inventions of others." Whether he said this when off his guard I cannot, of course, say. It was the truth, and the indiscretion of such an admission—in fact of any admission—is evident to any foolish person. What if he had written it and signed his name to it, and a commission of critics had called him to an accounting? And what if they had refused to write a word about him and we folks, four hundred years off, hadn't known who did what he did? Perish the thought! It is also related of Michael Angelo that when he left Florence to go to Rome to build St. Peter's he turned his horse's head on the last hill from which the noble cathedral, built by Brunelleschi, is visible, and said, "Like you I will not build: better than you I cannot." During the many years when he toiled and studied in the building of St. Peter's, at Rome, he had in mind this thought, yet he builded a dome whose intrinsic form was mighty like that of the model which he was scheming to avoid —not in details, not in ornamentation, but in the general conception.

What, after all, is this notion of being different, of doing things that are different? In a certain sense it is an appeal to the populace, a kind of demagoguery, and demagoguery we all know

to be wrong. Something strange and startling, the like of which never was seen on sea or land—that's what the crowd wants. But do they? Are we not coming, in this day and place, to a new era, where, if everybody doesn't own an automobile, at least he has an education and the first glimmerings, let us hope, of taste? There's nothing new under the sun, anyhow, so why must architecture be different in each case? A truce to all such humbug! The human mind cannot conceive anything that it has not perceived.

Sculpture and architecture are akin. When scuplture deals with the human form it takes it as it finds it; it does not attempt any novelties. The highest art of the sculptor is shown in refinement of form, rendering of expression, putting a soul into the image, something subtle, ineffable.

Architecture should take things as it finds them; it should not indulge in novelties. The beautification of the constructive truth that makes the architectural form that lies beneath the skin, as it were, this is the true province of the architect. And it is a question whether a whole lot more architects would not get into the Cyclopaedia if they followed this principle.

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And this brings us back to the words of Michael Angelo first quoted: "Only an inventor can use the inventions of others." It takes a great architect to prove this.

Until the completion of the New York Public Library, facing Bryant Park, America had one great library building, the Boston Public Library, a building whose main entrance a noted visitor, Mr. Arnold Bennett, recently declared should make it a Mecca for all the world. Since the completion of the New York Public Library there is on view from the rear a structure whose beauty will come to be regarded as being as great as that of the Boston building. The front of the New York Library is ordinary to a degree; the same may be said of the two ends. When the rear elevation is discovered by the critics I make this prediction, that it will be

acknowledged that Carrere & Hastings have, in part at least of this one of their works, done something really great. Whether some sharp eyes shall discover that the rear of the New York Library was lifted from the Bibliotheque Ste. Genevieve or from the Boston Library, I will not venture to say. If it helps to make the building famous and causes the crowd to gather, it may be better than if, as now, the contemplation of it is confined to the discouraged occupants of the park settees whose thoughts of architecture are presumably in abeyance. Those whom I have seen on the benches were either sleeping the sleep of the intoxicated or reading the help wanted columns in the newspapers.

The charge that Charles Follen McKim lifted the Bibliotheque Ste. Genevieve for his Boston Library reminds one of the accusation made by General Grant's enemies that he drank too much whiskey. Lincoln's reply that he would like to get a few barrels of the same brand to give to his other generals makes one think what a pity it is that there are not some more buildings like the Bibliotheque Ste. Genevieve to be lifted.

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THE HOLLOW-TILE FIREPROOF HOUSE

Article X.—Sand Moulded Concrete Floors and Ceilings.

By FREDERICK SQUIRES

AXIOMS of architectural design unchanged since Roman times, are combined in this interesting subject with engineering principles new as the use of reinforced concrete. The coffer found expression as a principle of architectural design in the Roman ceilings, and still exists architecturally in our best work. This span of time is tellingly illustrated in the ceilings of the old Basilica of St. Paul, at Rome, and the unfinished Avery Architectural Building at Columbia. The engineering features I will describe.

The strength of a concrete beam depends on its depth, and for this reason the same quantity of concrete and reinforcement divided into parallel beams with a thin top slab will carry a greater load than an equal amount in a solid slab, which is really a series of contiguous beams. Because they cross-bridge each other, the same quantity of concrete in beams crossing at right angles will carry more load than an equal amount of concrete forming parallel beams. This beam method is a better way of distributing concrete than the slab method because of the following peculiar qualities of concrete. It has great power to resist destruction by compression and shear, but little, if any, to resist destruction by tension, for which reason it must be strengthened where subjected to tension by steel (very aptly called "reinforcement.")

It is ABC to the engineer to divide the section of his slab or beam by a neutral axis at its center regarded vertically, and to consider the material above this axis to be subjected to compression and the part below to tension, the quality that keeps these two from acting independently being the strength to resist shear.

The concrete above the neutral axis, that in compression, is doing what it is physically best qualified to do, namely to provide compressive strength; but the concrete in the tension zone is quite unfitted for any job except to tie the reinforcing steel into its harness.

It will thus be seen that in the part of a concrete slab below the neutral axis there is a great amount of idle concrete. When the lower part of the construction is divided into beams, the amount of idle concrete is greatly reduced, owing to the voids formed between the beams. An ideal condition would be to provide just enough concrete in the lower half to cover the iron and sufficiently fireproof it. This is a far cry from slab construction. The slab on top of the beams is concrete strictly on its job, doing good compressive work. The persistence of flat slabs over the beam and slab systems in concrete construction is due, in a large measure, to the difficulty of construction and consequent expense of wooden forms and the inelasticity of the wood form method. I believe both are now removed by the cheap and elastic qualities of sand moulding, and the coffered beam method which is both artistic and structural, is made practical.

The concrete beam and tile construction is not the ideal method because the tile is but a filler to give depth to the beam, and after the beam is cast it is useful principally to give a surface for plastering. This tile filler, because it must be a rectangle, ties the construction up to two forms—beams running in one direction, or in two directions at right angles to each other.

Too much effort has been directed to

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obtaining a flat surface for plastering. Either tile blocks are required, or when plastering is to go directly on concrete, the aggregate for the concrete must be cinders, a very questionable material for constructive purposes. That such indirect methods should be used in the interests of plaster presupposes plaster to be the most desirable material to expose for a ceiling. This was true up to a recent date, but it is no longer true. Concrete has been so far beautified that its appearance is better than plaster. Compare a plaster cast in high relief with its duplicate in concrete. The plaster by comparison is cold and cheap. It lacks the color, the texture, and the appearance of solidity which are present in a high degree in the concrete image. Architects have gone so far as to leave off the hard finishing coat of plaster and roughen with sand the final coat in order to get away from the staring dead white surface of common plaster. When not roughened, plaster must be tinted. All this shows that the appearance of plain-finished plaster work is unsatisfactory.

When the question of elaborating the architectural effect of the six surfaces of a room is considered, it is always the ceiling which receives the most attention. This is true alike in the public building—as witness the ceilings of the New Theatre, the New York Public Library, and the waiting room of the Pennsylvania station—in the city house and in the country house. It is an accepted principle of design and decoration. The designer of the public work may execute

FIG. 1. PLASTER IMPRESSION FROM A CLAY MODEL.

his ceiling in stone, the city mansion designer in plaster or carved wood and color, and the country-house architect in moulded wood beams, but each in his own way puts the greatest emphasis of his interior on the ceiling. This is true now, and it always has been true, and always will be.

With the use of the light-colored cements, concrete advanced rapidly in beauty. Since concrete is a combination of cement, sand, and stone, there is no difficulty in obtaining the appearance of certain natural stones, marble for example, by mixing broken or powdered marble with cement and sand. Beautiful reproductions of marble statuary in concrete are results obtained every day. The difference in cost and the similarity of the result between pouring a liquid into a mould, and chiseling the same form out of a block of stone is responsible for much of the present-day activity in moulded concrete. Most lovely colors are easily obtained. The surface is dull

FIG. 2. THE PLASTER IMPRESSION, THE GLUE MOULD AND ITS PLASTER REINFORCEMENT.

and so gives a chance for display of soft tones.

It is concrete—a material which may display stone as a part of itself—which may be so mixed as to produce beautiful colors, and which gives its best structural results in the architectural form of a coffered ceiling, which we are now going to make into ceilings with sand moulds.

FIG. 3. PLASTER FORMS AND REINFORCEMENT IN POSITION.

The invention here described in floor construction involves the decoration of the ceiling and the casting of the constructive floor in the same operation. It may be described as the placing on a wooden centering of temporary forms of moulding material, the placing of reinforcement into the spaces between the moulds and the pouring of the concrete around and over these forms and the subsequent removal of all the temporary work, leaving the completed concrete ceiling in the inverse image of the moulds. In the flexibility of the material for the moulds, the temporary fluid quality of concrete, and the wide range of material which may enter it and give it character, rest the possibilities of the scheme. The drawings illustrate how simple it is to divide the ceiling into myriad combinations of forms, practically kaleidoscopic. Add to this the fact that the method welcomes all the compressive forms, such as the classic and Gothic, the dome and the vault, and it is immediately seen that the number of possible combinations of forms is limitless. There is a wide range of combinations of aggregates which may be used to make up the concrete—marble, limestone, granite, quartz—and boundless possibilities for insertion into the moulds of mosaics of glass or tile which will be held and displayed in the finished concrete. Architectural forms like the rosette may be cast separately and inserted into the moulding sand and so arranged as to bond in with the slab after the removal of the sand. The forms may be sprayed with a liquid mixture of cement and any sparkling material such as broken glass, and a shell of it formed over the moulds which will be the visible part of the slab when the forms are removed.

Another scheme lately developed is the enrichment of concrete ceilings by blowing upon the wet slab a mixture of cement and color, which is literally cemented to the ceiling by its own chemical affinity. Colors may be applied directly to the top of the mould by pouring on a film of the liquid coloring material and cement and allowing it to harden a

FIG. 4. COVERING WITH CONCRETE.

little before the commoner materials of the bulk of the slab are poured. The obvious method of forming panels of cement and using them as permanent forms has been tried and is here illustrated, but this lacks the fascination of the fluid method and has some physical disadvantages.

Before bewildering the reader with a multiplicity of suggestions, it may be well to explain the process by means of photographs. He will see for himself just what wonderful chances there are.

For over a year I tried experiments in moulding materials before I settled on moulding sand as the best. Clay gave results but had to be covered with paper in order not to soften under the moisture of the concrete. Plaster was next considered. A coffered unit about sixteen inches square was drawn to full size in the office and sent to a plasterer, who made a clay model of it from which he made Fig. 1, a negative impression to be used to make the glue mould. Fig. 2 shows the glue mould in the middle, below it a plaster reinforcement into which it sets, and above it a typical negative or plaster form. Fig. 3 shows the plaster forms in place with the reinforcement in its proper position, and Fig. 4 shows how it is intended to place the concrete. Fig. 5 shows the experimental slab cast from these plaster forms. The plaster method was not ideal because of the time it takes to make the plaster forms and the loss of these by breakage when they are removed from the finished concrete ceiling. The glue mould also has to be renewed

FIG. 5 THE EXPERIMENTAL SLAB CAST FROM THE PLASTER MOULDS.

after every dozen casts and it consumes time and increases the expense in remaking.

The coffers shown in Figs. 6, 7 and 8

FIG. 6. PRE-CAST PERMANENT FORMS.

were pre-cast and set in place as permanent forms. The disadvantages of this method are obvious from the photographs: the concrete forms are fragile. They offer, however, the advantage of a

FIGS. 7 AND 8. PRE-CAST PERMANENT FORMS, REINFORCEMENT PLACED AND CONCRETE BEING POURED.

good opportunity to treat the concrete with brush color or acid after it has partially set, and the concrete used over the permanent forms may be of ordinary materials and the forms themselves may be cast in durable metal moulds. On the other hand, they add nothing to the strength of the floor construction and are a positive load. They would have to be cast with a mechanical bond for the backing material because the cohesion between the two concrete surfaces could not be definitely counted on.

In justice to this method be it said that the difference in appearance of the four coffers in the picture was an intentional one and was due to an effort to study a different color effect in each one.

FIG. 9. THE MATRIX REINFORCED WITH CLOTH, USED FOR THE SAND MOULDS.

Fig. 6 is a view of the coffers as they would appear in the finished ceiling. Fig. 7 shows the reinforcing in place, and Fig. 8 the method of pouring with concrete. This method has possibilities but is not yet developed to the extent of the sand mould method.

The practical sand mould method is shown in the following pictures. I got the sand method idea by watching children at play on the beach. They happened to groove the hard sand in a gridiron pattern with their hoes, and these grooves seemed strong enough to receive concrete without losing shape. A few

experiments with beach sand, a little attention to the iron moulders, and the idea of sand moulds for concrete floor construction began to evolve. When I called to mind my modeling experience at Columbia, the idea of highly decorated ceilings made from sand moulds became a conviction. After a winter of experiments, the first floor was modeled and poured, and the following photographs were taken during the process. The matrix or moulder shown in Fig. 9 was made from the same design as the one used for obtaining plaster forms. It is a positive and is made of thick plaster reinforced with cloth mesh to give it wearing qualities. It is the exact size of the unit including half the width of the beam all around. On two sides are cast projections for handles. Where decoration is not desirable or required this matrix may be made of wood, and this was also done in these experiments, and illustrated here with photographs of the wood mould empty, sand filled and covered with a palette and the finished cast slab (see Figs. 10, 11, 12 and 19). The process of making sand moulds from the plaster matrix is ridiculously simple. The sand is ordinary moulding sand which in this particular case was mixed with marble flour placed there to adhere to the concrete slab and lighten its color. The matrix is set on two parallel two-by-four studs laid on the floor and the dampened moulding

FIG. 10. THE WOODEN MATRIX.

FIG. 12. THE WOODEN MATRIX, WITH THE PALETTE COVERING IT.

FIG. 11. THE WOODEN MATRIX, SAND-FILLED.

FIG. 13. TAMPING THE SAND INTO PLACE IN THE PLASTER MATRIX.

FIG. 14. THE SAND MOULDS WITH THEIR PALETTES SET ON A TEMPORARY CENTERING.

FIG. 15. THE REINFORCING BARS PLACED BETWEEN THE MOULDS.

FIG. 16 THE CONCRETE PARTLY POURED.

FIG. 17 THE FLUID CONCRETE IS POURED BETWEEN THE SAND MOULD AND FLOWS UPWARD AND OVER THEM.

sand is heaped into it and tamped by gentle blows from the sand bag, both shown in Fig. 13. When full, the top is leveled with a straight edge and a palette of $\frac{7}{8}$-inch wood, made just the size of the matrix, is set on top and the moulder overturns the two, settling the palette down on the two-by-fours and freeing the sand mould from the matrix by a gentle blow with the sand bag. Then the matrix is lifted and the palette with its sand mould is set on the temporary centering, as is illustrated by Fig. 14. These moulds are hard enough when placed but they can be made almost like iron by mixing the sand with flour water or molasses, and baking, a method unnecessary in ordinary work. Rosettes may be precast in concrete and provided with a stem which will protrude through the top of the matrix and extend above the sand in the mould, these stems serving as mechanical bonds between the rosettes and the slab. As has been said before, these sand moulds, now in place, may be treated in an infinite number of ways by covering with broken glass, stone aggregates, tile insertions, colored cements and powders to provide effects in the finished ceiling.

Fig. 15 shows the reinforcement laid in place in the beams. Also the plank pouring platform and the ladders on which the concrete is raised, are shown in place. A man stands ready to place the concrete, part of which is seen already poured on the extreme left of the pioture.

Fig. 16 shows the concrete mounting up along the sides of the sand moulds and in Fig. 17 it has completely covered some of them. None of the moulds were injured by the concrete, which was poured from pails and the only care used was in directing the stream along the beams and not directly upon the top of the sand moulds.

Panels of ceiling done in 16-inch sand moulds from the elaborate plaster matrix are shown in Fig. 18, and Fig. 19 shows the result with sand moulds done from a simple wooden matrix. I am now framing a casting made for a matrix which will give more sharply cut results than either of the others.

In concluding this description of what has been a most engrossing series of experiments, I believe that a wide new field in design has been opened for the architect and concrete engineer.

FIGS. 18 AND 19. PANELS FROM THE CEILINGS CAST FROM SAND MOULDS, MADE FROM WOODEN AND PLASTER MATRICES.

FAILURES IN BUILDING CONSTRUCTION AND THEIR LESSONS—III.

CONCRETE COLUMNS

By EDWARD GODFREY

SO-CALLED reinforced-concrete columns, columns of plain concrete with slender rods embedded in them (without close hoops or spirals to hold these rods rigidly in line), are a prolific source of failures; and the marvel of it all is that with the large number of these failures and the great loss of life and property they have occasioned, the eyes of engineers have not been opened to their absolute untrustworthiness—this in spite of the fact that laboratory tests point to the same conclusion. Designers go merrily on proportioning and building columns of this kind and discussing the loads they can sustain with an assumption of accuracy that is about as far from truth or science as a Hindoo's incantations over a broken bone are from the modern science of surgery.

If these designers use a square or round-shaped wire around their slender rods, spaced a foot or more apart, they call it a hooped column.

Every great reinforced-concrete wreck, about a half a score in number, has had these rodded columns, which the latest proposed building code for New York, on page 83, rightly, though probably inadvertently calls "plain columns."

The writer has been vigorously condemning this kind of so-called reinforced-concrete columns for six years. With arguments that have never been answered, in his book, "Concrete," and in a paper read before the American Society of Civil Engineers, March 16, 1910 (Some Mooted Questions in Reinforced-Concrete Design), and in numerous communications to engineering periodicals, the writer has pointed out the absurdity of such design.

Several critics have tried to read into the writer's arguments a criticism of hooped columns and have tried to cloud the issue by bringing in a lot of tests on hooped columns and massing them with slender rodded columns to mask the weakness of the latter. The nearest thing to an argument in defense of these rodded columns is an hysterical reference to the average strength of a lot of hooped and rodded columns as compared with plain concrete columns; and yet some plain concrete columns are 25 and 50 per cent. stronger than similar rodded columns, showing that the presence of the slender rods may weaken the column.

Reports on reinforced-concrete building failures are generally exceedingly misleading and barren of real information. They are usually in reality the work of lawyers who are looking after the interests of clients and aim to obscure rather than reveal the truth. There is so much similarity in them that they could almost be got up in blank form and filled in, if frequency of the wrecks should demand it, leaving a place to fill in "block of wood," or "shaving," or "sawdust," and the number of the column in which they were found; also a blank could be left for the location where a bad batch of concrete was found, as well as for the name of the dead workman who pulled out the props before the exact time was up. A few other standard findings could be incorporated in the form, together with a line stating that the design was found faultless.

If a single rivet were omitted in a

FIG. 1. PHOTOGRAPH OF WRECKED BUILDING AND SEASONED COLUMN WHICH FAILED POINT OF FAILURE INDICATED BY CIRCLE.

steel frame building, and the entire building were wrecked on account of this omission, it would be nearly on a par with the supposed reason for these great reinforced-concrete building failures, so slender is the hair upon which the safety of these buildings depends. It ought not to be within the range of possibility that a little bad concrete, a little carelessness in cleaning out forms, a little laxness of inspection, could result in an awful wreck. It would not be possible, if the columns of a building were propertly designed.

One of the great wrecks was the Hencke Building in Cleveland, O. This wreck is described in "Engineering News," Dec. 8, 1910. In "Engineering News," Jan. 26, 1911, appears the report of the commission appointed to investigate this collapse, also a letter on the subject, written by the writer a few days after the published report of the failure. The letter is quoted in full below:

"The latest wreck in reinforced concrete described and illustrated in your issue of Dec. 8, 1910, p. 636, is just another finger of scorn pointed at the engineering profession.

"In spite of what the findings may be of the men who are investigating this wreck, there is enough in the photographs of the building to condemn its design and place it in the large class with all of the other great wrecks of reinforced-concrete structures. They may find a shaving or a wooden block in the wreck of one of the columns or build a worthless theory on a splinter, as has been done before, but the glaring truth stands out that plain concrete shafts are unfit to support heavy loads, and slender rods in these shafts do not reinforce them; also this harvest of death emphasizes the absolute need of a unifying element in all reinforced-concrete structures.

"The pictures of this wreck show two features of its design that condemn it, and yet one could read engineering literature concerning reinforced concrete for days without ever finding a hint of the danger of these features· one could also find many examples of these erroneous features in the work of experts of national prominence Here is where the profession is to blame for these wrecks.

"In 'Engineering News,' in 1906, the writer pointed out the error in depending upon longitudinal rods in a concrete column. He has at various times condemned such design publicly in the most emphatic manner possible A large reservoir roof in Madrid, a hotel in California, a building in Rochester, another in Philadelphia—all of these, the greatest wrecks recorded, had longitudinal rods in the columns. They could not possibly have failed as they did, if they had had tough steel columns or properly hooped reinforced-concrete columns.

"I have repeatedly flaunted these facts in the face of the engineering profession and challenged contradiction. In my paper, 'Some Mooted Questions in Reinforced-Concrete Design,' read last March before the American Society of Civil Engineers, and very widely discussed, I made very prominent a severe criticism of this flimsy method of design. Only

one critic came forth with anything resembling an argument, and he, by averaging an indiscriminate lot of hooped and other columns with steel in them, tried to satisfy himself that nursery columns are greatly strengthened by slender longitudinal rods. By cutting out four of these nursery tests in one group the averages for that group would tell exactly the opposite tale. This is supposed to be careful investigation! Some of the tests with no steel whatever were 25 and 50 per cent. stronger than others with steel rods in them. Astounding as it may seem the very pamphlet that shows these results, written by one of the best known authorities in this country, *recommends the addition of 17 to 20 per cent. to the strength of plain concrete columns for each per cent. of slender steel rods added!* Nearly all books on the subject are guilty of the same gross errors. It is time for plain speaking in this matter. Why do not these authorities come out and demonstrate their position with something better than a lot of averages that mask more than they reveal? Or else why do they not acknowledge their error?

"The nursery columns, loaded perfectly central, tell only a part of the weakness of these columns in a monolithic building. The least movement or settlement in such a structure, with no articulation and no toughness, puts excessive strains on the weakest part of the frame. In this construction it is the columns that are designed as mere props with no ability to resist bending. Cracks in these mean spalling and stripping of the concrete, and disaster.

"In one wreck the entire reinforced-concrete roof of a large building collapsed, because the concrete had been frozen and was not set. The top floor and the columns below it were not hurt. The columns were octagonal and were hooped. Their toughness saved the building. All this despite the fact that under test it developed later that the floors were not capable of carrying their supposed safe load.

"The unifying element referred to in the first part of this letter as being absent in the Cleveland building, is continuous rods through the columns to tie the beams together. In a steel building this is supplied by the rivets. In many reinforced-concrete buildings it is lacking. There is no sign of any such design in the photographs of this building. There is no doubt whatever that tenacity is the one thing that a reinforced-concrete structure needs both in the whole and in all of its members, particularly the columns. A column that can bulge out or be spalled off by the mere overcoming of the weak and uncertain tenacity of plain concrete is an unsafe column for heavy loads. Highly stressed slender rods aid in this bulging tendency and hence menace the strength of the column they are supposed to reinforce.

"It is a shame and a burning disgrace to the engineering profession that no more is learned from investigations of disasters such as this than that practical construction is not absolutely perfect, materials are not absolutely clean; such reports could be written thousands of miles away from the wrecks. The tremendously important lesson is ignored that these columns are absolutely untrustworthy.

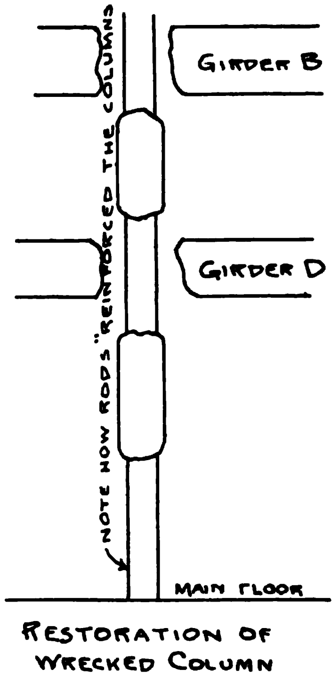


FIG. 2. SKETCH SHOWING MANNER OF FAILURE OF COLUMN AND GIRDERS.

"If a man should aim a revolver point blank at another's heart, and wound him instead through the lung, and if the other man should fall dead of heart failure at hearing the report of the shot, physicians might demonstrate that death was due to fright at hearing the noise and that a cannon cracker might have produced the same effect, and they might clear the murderer by this technicality. If it is found that there was a bad batch of concrete somewhere that set off this wreck, it would supply a technicality such as the other, but it will not clear the engineering profession of wilful ignorance.

"It is the profession, as represented by its leaders in framing literature and its foremost members in the reinforced concrete field, that is responsible for this wreck and not the individual designer who may have done his utmost in following standard, though abominable practice."

Several other wrecks have taken place since the Hencke building failure. In one near Pittsburgh, exactly the thing occurred that the writer anticipated in the foregoing letter. A column on a totally inadequate footing settled more than an inch; the highly stressed parts of the building gave way first by spalling of another column, then by total collapse.

FIG. 3. PHOTOGRAPH SHOWING MANNER OF FAILURE OF RODDED COLUMNS.

A significant and instructive feature of this wreck was exhibited in the breaking by spalling and cracking of a column in a portion of the building (of somewhat different construction and of greater age), which did not fail. This column, though under but 200 lbs. per sq. in. of compression, and though situated 60 or 80 feet away from the wreck, broke apparently because of the mere trembling of the earth. The columns in the collapsed portion of the building were under three or four times as great compressive stress. They were demolished, and their "reinforcing" rods were curled up in fantastic shape, a characteristic of such failures.

The reason why these upright slender rods do not reinforce a concrete column is absurdly simple of explanation. When the concrete is poured and sets, it shrinks. The steel rods are then longer than the concrete or else are subject to an initial compression. When the load comes on the column, the tendency is to shorten it. This puts additional load first on the steel rods. A slender rod in compression will, of course, tend to buckle. These rods have only a little concrete over them to prevent them from buckling. Concrete is no material to tie steel and hold it rigidly in line, and naturally the concrete readily spalls off, allowing the steel rods to buckle. This is doubly weakening to the column, for it cripples the steel and diminishes the concrete area in compression.

The foregoing explanation is so simple that any intelligent person can be made to understand it, and yet wise engineering authors stuff their books with foolish and highly theoretical trash purporting to show just how the compression in a rodded column is divided between the concrete and the steel. They recommend large increase in the calculated strength of a concrete column when a little ~~weakening~~ steel is added.

The only way that steel can be made to reinforce a concrete shaft is by supplying that which the concrete lacks, namely, tenacity. When the steel is in slender rods lying in the direction of the compressive stress, the tenacity of the shaft is in no wise aided. The sooner such wreck-breeding columns are eliminated from designs, from building codes, from committee reports, from books, the better for designers, for contractors, and for the public.

Figs. 1, 2, 3, and 4, illustrate the behavior of rodded concrete columns in wrecks.

In Fig. 1 the column near the center of the photograph is seen to be doubled over, illustrating its utter lack of toughness. For some days after the wreck this column stood upright, carrying no load, however, for the girders readily broke away from it. The upper part was pulled over to prevent its doing damage in falling. Imagine a steel column being broken over like this in a collapse and doubling up flat with the aid of a little rope.

The circle in Fig. 1 indicates the point of failure of the column loaded to 200 lbs. per square inch, referred to in this paper.

Fig. 2 shows the restoration of a wrecked column and the girders which it supported, as shown in an engineering periodical. The utter inadequacy of the rods as reinforcement of the concrete shaft is well shown. Fig. 3 is a photograph illustrating the same thing. Note the long rods, stripped of any ties that may have been present. This standard of design usually has wires a foot or so apart that are supposed to tie in the vertical rods. Note also how the columns are broken away at the beam connections in both Figs. 2 and 3 illustrating the inadequacy of provision for shear. A hooped column (with close-spaced hoops) would not fail in this manner. A steel column made of stiff sections latticed or battened and filled and surrounded with concrete would obviate this weakness. This could be done either by providing steel seats for the girders or by running inclined reinforcing rods through the column.

Fig. 4 shows another example of a rodded column failure. The corner column, shown in the foreground, was of very large section and carried comparatively little load. The trifling strength of the column and lack of toughness are clearly shown by its failure.

FIG. 4. PHOTOGRAPH SHOWING FAILURE OF HEAVY CORNER COLUMN.

THE UNITED STATES RUBBER CO.'S BUILDING

CARRÈRE & HASTINGS, Architects

THE U. S. Rubber Company Building is located on the southeast corner of Broadway and 58th Street. Twenty stories of white, green-tinged Vermont marble, with dark indented window panels and a surmounting cornice of copper, wide projecting but tinted in color, make it a striking object to the south of Central Park.

We pass rapidly over the many points of the building which are good to look upon. There is a delicacy in its architectural design which is well supported by the materials employed, but for our discussion the structural features furnish a greater attraction.

The foundations are upon rock. Each column footing is made up of a grillage of steel beams set on a concrete leveling course and embedded in concrete. The walls of the sub-basement and basement start on a leveling course on the rock. Above the street level they are curtain walls. The structural frame is of steel, the heavy girders being built up and the lighter girders and beams being rolled sections. As shown by the framing plan of the tenth floor, the bays are of fairly regular division, despite the irregular shape of the building. Along the street sides the columns are spaced 14 feet center to center, and 20 feet 3 inches center to center between the outside columns and the next row. The floor system is terra cotta block side construction, and the main partitions running from floor to ceiling are of 4-inch and 6-inch terra cotta blocks according to the height.

The floor surfaces are of concrete, with the exception of the principal halls and corridors, and the toilet rooms, which have terrazzo flooring, and certain floors and corridors in the company's offices, which have rubber tiling.

The interior trim of the building is of hollow steel, and Dahlstrom hollow steel doors are used in all openings. As exceptions to this general rule may be noted the railings and counters, and some partitions in the company's special offices which are of fireproofed wood.

All the windows of the two street facing sides have kalameined frames and sash glazed with plain glass. These were supplied by the Knoburn Co. The two sides facing adjoining property, and the light court to the east, have hollow metal frames and sash glazed with polished wire glass.

The elevator service consists of six Otis traction passenger elevators, three of which run from the basement to the 14th floor, and three from the ground floor to the 20th floor. There is one freight elevator with a rise of the total height of the building. There is a second freight elevator of short rise connecting the sub-basement, basement and first story, and a short rise passenger lift and ash hoist. Between the 14th and 20th floors, there is another short rise passenger elevator for service to and from the company's offices.

There are two principal stairways in the building, each enclosed in fireproof hallways. One of these stairways, as shown by the illustration of the rear of the building, is only approached by external balconies in the court. To reach it, it is necessary to go entirely without the building, approaching from the main elevator hall. The stairway is thus completely isolated from each floor except the ground floor where it gives on to the

THE UNITED STATES RUBBER BUILDING, BROADWAY AND 58TH STREET, NEW YORK.

General Contractors: Norcross Bros. Co.
Electrical Engineers: Ewing, Bacon & Henry.
Kalameined Windows Knoburn Co

Carrère & Hastings, Architects.

principal hallway through a fire door. The other stairway is in the north wing and adjoins the freight elevator. This stairway is shut off from each story by a hollow steel door glazed with wire glass.

The plan of a typical story which is given, shows the location of the stair halls, elevators and the toilet rooms.

PLAN OF THE TENTH STORY.

THE REAR OF THE BUILDING, SHOWING THE BALCONIES LEADING TO THE ENCLOSED FIRE-STAIR.

Carrère & Hastings, Architects.

TYPICAL ELEVATOR HALL.

FREIGHT ELEVATOR AND CHUTE ENTRANCE TO BASEMENT.

THE U. S. RUBBER BUILDING

Carrère & Hastings, Architects.

Ornamental Iron. The Winslow Bros. Company.
Otis Traction Elevators.
Corbin Hardware.
Hollow Steel Doors and Trim, Dahlstrom Metallic Door Company.

Star Expansion Bolts Used.
Chicago Spring Butts Used.
Steel Rolling Shutters: Jas. G. Wilson Mfg. Co.

THE BOILER EQUIPMENT FOR HEATING.
Boilers Manufactured by the Fitzgibbons Boiler Co.

The fire balconies above mentioned, of which we show the construction details, are cantilevered from the wall, as shown by the section at A-A. The balconies themselves are built of reinforced concrete and the construction is a very simple and substantial one. The supporting beams of the balcony rest on a 20-inch I-beam in the wall, and are fastened under 12-inch channels at the inner face of the wall. The length of the balcony beams is 5 feet 4 inches.

The New York branch of the U. S. Tire Company occupies the sub-basement, basement, ground floor and mezzanine, and is the local sales department of the company. The 14th floor is occupied by the General Rubber Company, the 15th to 17th by the U. S. Tire Company and the 18th to 20th by the U. S. Rubber Company. The 2d to 13th floors of the building are rented to outside parties. Connecting the stories occupied by the rubber companies there are private stairways as well as the short rise elevator, previously mentioned, for the facilitation of service.

A pneumatic tube system connects all the offices of the U. S. Rubber Company and the offices of its allied interests on the ground and upper stories, facilitating service and the delivery of messages at all points.

There are ducts run up through the building for various purposes, located mostly at the columns. Water supply circuits are placed in small chases, and plumbing lines in the larger ones. There are separate pipe shafts for each of the toilets and two separate shafts for the electric conduits and a shaft for low tension wires.

The finish of the building consists of a fine entrance hall, floored and panelled to the ceiling with Botticino marble topped with an ornamental frieze and ceiling in plaster. The upper stair halls

SALES ROOM OF THE U. S. TIRE CO., FIRST FLOOR OF THE U. S. RUBBER BUILDING.

Clocks: The Magneta Company, Inc. Carrère & Hastings, Architects.
Evans' "Crescent" Expansion Bolts Used. Grant Sash Pulleys.
Metropolitan Detachable Push Button Switches. Stanley's Ball Bearing Hinges Used.
Ornamental Plaster and Imitation Caen Stone: H. W. Miller, Inc.
Woodwork. George W. Cobb, Jr. "Fresco" White Paint Used.

are wainscoted with white marble with plain plaster above. The stair halls are plainly plastered with slate bases, and the stairways are of plain iron with slate treads. The elevator fronts throughout are of simply designed ornamental iron. This work was done by The Winslow Bros. Company. In the store the imitation Caen stone was put in by H. W. Miller, Inc., who did the ornamental plastering throughout the building. The trim, which is of mahogany, was done by George W. Cobb, Jr.

The fire protection system consists of three stand pipes concealed within the walls, one located in each stair well and one in the main elevator hall. The hose reels are open in the stair halls and enclosed in cabinets in the elevator hall. The doors to the freight elevator are Peelle automatic fire doors and a Wilson steel rolling shutter is used at the U. S. Tire Company's freight entrance and a folding type door at the general freight entrance.

An automatic sprinkler equipment is provided in the basement and sub-basement, and the stand pipes are in so that any floor of the building may be equipped if necessary. The supply is from two compression tanks placed on the roof.

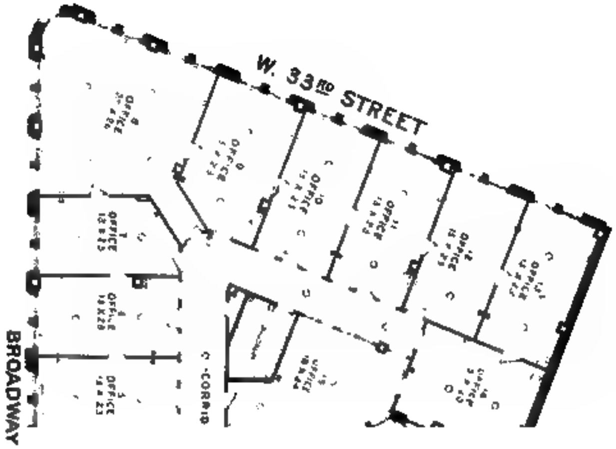
In the offices of the rubber company the partitions are of African mahogany which is fireproofed wood, glazed with large glass panes. There is a Gamewell auxiliary fire alarm system installed, with signal boxes on every floor in the main elevator hall. There is a Magneta clock system throughout the building with a fine double-faced clock in the store.

The mechanical plant is reduced to a minimum and is divided between the sub-basement and the roof. The sub-basement has coal pockets on the north side which open directly into the boiler room, wherein there are three Fitzgibbons heating boilers for the heating system and hot water supply. All equipment is in duplicate. There are two electrically driven vacuum pumps in connection with the heating system. The water supply consists of two electrically driven house pumps, a large suction tank, and three steam hot water heaters for low, intermediate and high supply, the building being divided into three sections for economy of service. There are three sump pumps for sewage disposal. The blower for the pneumatic tube system is located in the sub-basement. The mechanical ventilating system consists of a forced draft fan which supplies clean, cool air through a Webster air washer, and an exhaust blower which rids the rooms of the basement and sub-basement of foul air. On the roof in the pent houses are the overhead machines of the elevators, and various pumps. The vacuum cleaning is done by portable cleaners. Edison service is used for all power. Ewing, Bacon & Henry were the electrical engineers. Frank Sutton was the heating engineer. The structural steel was furnished and erected by Post & McCord, and the general contractors were Norcross Brothers Company.

PERSPECTIVE OF THE ARCHITECTS' BUILDING, PARK AVENUE AND 40TH STREET, NEW YORK.

Engineers and Managers: Ewing, Bacon & Henry.
Star Expansion Bolts Used.
Evans' "Crescent" Expansion Bolts Used.
Otis Elevators.
Fireproof Windows: S. H. Pomeroy Co., Inc

Ewing & Chappell, La Farge & Morris, Associate Architects.



THE WILSON BUILDING. TYPICAL PLAN. DOORWAY ON BROADWAY.

Rouse & Goldstone, Architects.

Bronze Entrance Doors Penn Brass & Bronze Works.
Dahlstrom Metal Trim.
Metal Lath: Arthur Greenfield, Inc
Fireproof Windows: S H Pomeroy Co., Inc.

THE WILSON BUILDING, WITH THE HOTEL MARTINIQUE AS A BACKGROUND,
BROADWAY AND 33RD STREET, NEW YORK.

Otis Elevators. Rouse & Goldstone, Architects.
Dixon's Silica-Graphite Paint Used
Stanley's Ball Bearing Hinges Used.
American Enameled Brick Used
Metropolitan Detachable Mechanism Switches.
Fireproof Doors, Leonard Sheet Metal Works.

NATIONAL STATE BANK, NEWARK, N. J.

Builders; W. H. Fissell & Co. Cass Gilbert, Architect.
Mill Work: Fitzgerald-Speer Co.
Fireproof Doors and Windows: Leonard Sheet Metal Works.
Chicago Spring Butts Used.

NATIONAL STATE BANK.

Floors: General Kompolite Co.
Revolving Doors: Atchison Revolving Door Co.
Lighting Fixtures: The Browe Company.
A. B. See Elevators.
Metal Lath: Arthur Greenfield, Inc.
Grant Overhead Sash Pulleys Used

Cass Gilbert, Architect.

AN OFFICE FOYER FLOORED WITH KOMPOLITE.

THE "CURVED WING" REVOLVING DOOR AT THE MAIN ENTRANCE.

THE MAIN FOYER.

NATIONAL STATE BANK, NEWARK, N. J.

Cass Gilbert, Architect.

A. B. See Elevators.
Lighting Fixtures: The Browe Compa ny.
Floors General Kompolite Co.
Revolving Doors: Atchison Revolving Door Co.
Mill Work: Fitzgerald-Speer Co.

OTIS ELEVATOR BUILDING, NEW YORK

CLINTON & RUSSELL, Architects

IN order to bring all of its offices and departments under one roof, the Otis Elevator Company has erected on the east side of 11th Avenue, between 26th and 27th Streets, a new building which from the standpoint of construction is an excellent example of a building ~~combining business~~ offices and service work.

THE BUILDING AND ITS CONSTRUCTION.

The building faces on 11th Avenue with a frontage of 100 feet 2 inches on 26th Street and 125 feet on 27th Street. It has seven stories and is 117 feet high from curb to cornice. The first story is 18 feet 3 inches in the clear and has a mezzanine running its full length at the back. The second story is 13 feet 11 inches high, the third, 13 feet 2 inches high; the fourth, fifth and sixth 11 feet 8 inches, and the seventh story 12 feet clear. On the roof are the kitchen, tanks, and elevator pent houses. The garage which houses the company's machines occupies three stories on the ~~26th Street side~~ with a mezzanine floor between the first and second stories, and is entirely separate from the main building. Every contrivance for the proper care of the automobiles is included in this equipment.

The building rests on pile foundations capped with grillage footings composed of steel beams bedded in concrete. The frame is of structural steel, the beams and girders dividing the floor area into regular panels of about 20 feet square, which are spanned by Roebling system concrete floor arches.

The exterior walls are curtain walls of brick. The street faces above the Conway pink granite base are of tapestry brick laid with half-inch joints. The faces of piers, and spandrels below windows are ornamented with a panel treatment in the brick work with ornamental cartouches of limestone. The interior court walls are of light buff brick. The building is topped ~~out~~ with a wide, overhanging, heavy pressed copper cornice of elaborate design. The live floor loads are 300 pounds per square foot for the second floor, 200 pounds for the third, and 120 pounds on all floors above. The first story rests upon the ground. The roof surface is of slag waterproofed in the usual manner on top of the concrete roof system.

There are four fireproofed enclosed stairways in various sections of the building leading from the entrances on the 26th and 27th Street sides and the main entrance on 11th Avenue.

The flooring throughout with the exception of the ground floor, which is of cement, consists of maple laid on sleepers with a cinder fill between over the structural floor system. In the private and executive offices quartered oak is used. The interior fireproof partitions are of 4-inch hollow-tile about all vertical openings through the building and about the private offices. Elsewhere the office partitions are of wood and glass, oak on the second, third and fourth floors, and mahogany on the fifth, sixth and seventh. The street facing windows have wooden frames and sash, the court windows have kalameined frames and sash, glazed with wire-glass. All doors

OTIS ELEVATOR BUILDING. MAIN ENTRANCE FOYER.
Tapestry Brick: Fiske & Co., Inc. Clinton & Russell, Architects.
Chicago Spring Butts Used.
Evans' "Crescent" Expansion Bolts Used.

and trim in the stair wells and elevator shafts are of hollow metal. The doors are all self-closing.

THE ELEVATORS.

The elevator equipment comprises various types of machines of the latest Otis design.

FIRE PROTECTION.

The fire protection system of the building is very extensive. There is an interior automatic sprinkler equipment and a system of water curtains over the interior court windows. The standpipe and hose consists of three standpipes run up in three of the stair wells. The standpipes are 4-inch to the fifth floor and 2½-inch above. There are 29 hose stations in all, one of which is on the fire pump. The primary supply for the standpipe system is from the house tank of 10,000 gallons capacity. A secondary supply is from an external connection to this standpipe system from three Siamese steamer connections, one on each face of the building.

The automatic sprinkler system is wet piped throughout the building. It is supplied by a 30,000-gallon gravity tank, 20 feet above the roof and from a 750-gallon electrically driven rotary fire pump, located in the basement, and there is also connection to three Siamese steamer connections, one on each face of the building and separate from the connections supplying the standpipe system. There are three risers for the automatic sprinklers, one 4-inch and two 5-inch. There are no alarm valve connections on the sprinkler system. The sprinkler system is open-piped throughout, with the exception that in the entrance hallway and in the offices of the top floor, invert-

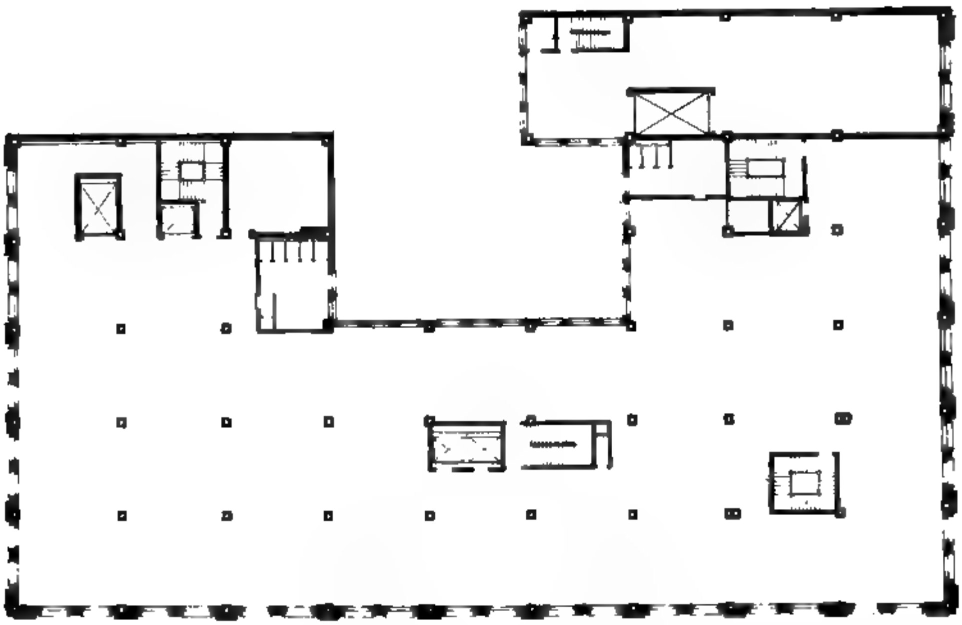
ELEVATION OF SOUTHWEST CORNER.
Clinton & Russell, Architects.

OTIS ELEVATOR BUILDING, 11TH AVENUE, 26TH TO 27TH STREETS, NEW YORK.

Builders: The Thompson-Starrett Co.
Tapestry Brick: Fiske & Co., Inc
Cornices and Roofing. Herrmann & Grace Co
Switchboards: Metropolitan Electric Mfg. Co

Clinton & Russell, Architects.

THE PRESIDENT'S OFFICE.



TYPICAL FLOOR PLAN
OTIS ELEVATOR BUILDING.

Clinton & Russell, Architects.

OTIS ELEVATOR BUILDING. SALES DEPARTMENT.
Metal Windows. Herrmann & Grace Co. Clinton & Russell, Architects.
Hollow Steel Doors and Trim: Dahlstrom Metallic Door.
Corbin Hardware.
Star Expansion Bolts Used.

ed sprinklers with concealed pipes are installed. International Heads are used.

The dry pipe, open sprinkler system which is designed to provide a water curtain over the court windows exposed to external hazard, is designed to receive its supply directly from the fire pump in the basement.

SERVICE AND POWER EQUIPMENT.

All power for the building is supplied by electric current obtained from the Edison service. A vacuum cleaner system with exhaust pumps in the basement and piped outlets leads to all points in the building. There are filters for the water supply and the water is chilled by ice coolers located above the drinking water fountains—two on each floor. Individual drinking cups are furnished for employees' use. The vacuum steam heating system is supplied with steam from three low pressure boilers located in the basement. For inter-department correspondence and orders, there has been installed a 15-station Lampson pneumatic tube system. There is both Western Union and Postal Telegraph service.

DEPARTMENT DISTRIBUTION.

Department distribution and the uses to which the various floors are put form an economic problem which we can but briefly discuss. The first and second stories are devoted to machine shops for the construction and service departments. The basement is occupied by the heating plant, pumping machinery, filters and other equipment for the house service. On the third and fourth stories are located the service department, drafting rooms, manufacturing and order departments, purchasing department, etc. The treasurer's and comptroller's departments, the legal and cost departments occupy the fifth story.

OTIS ELEVATOR BUILDING. THE BOARD ROOM AND VICE-PRESIDENT'S OFFICE.
Grant Sash Pulleys. Clinton & Russell, Architects.

The sixth story furnishes space for the general sales manager's office, sales, estimating, escalator and advertising departments.

On the seventh story are located the executive offices, board room, engineering room and the dining rooms for the company's employees.

SHOW ROOM.

To the right of the main entrance there is a show room for exhibiting elevator parts.

The building was built by the Thompson Starrett Company under the supervision of Clinton & Russell, architects. Fiske & Company, Inc., tapestry brick were used for the exterior. The automatic sprinklers and water supplies were installed by W. L. Fleisher & Co., Inc. Dahlstrom hollow steel doors were used. The copper cornices and metal windows were put in by the Herrmann & Grace Company. Loomis-Manning water filters were used.

FRAMING PLAN FOR 4TH, 5TH AND 7TH FLOORS.
OTIS ELEVATOR BUILDING.

(Advertisement Continued from August issue)

Read This Letter

Here is the Proof after 10 Years' use

Escalators (or Moving Stairways) are Indispensable wherever Installed

.evator Company,
New York City.

Gentlemen:

In answer to your letter of recent date as to the value of the Escalators or the carrying capacity of each, I wish to state that our machine leading from the Main Floor to the First Floor, has a carrying capacity of from six to ten thousand (6,000 to 10,000) people per hour. Of course, as this machine carries that amount of people, and with our eight (8) Elevators carrying passengers also, our machines on the upper floors have to carry crowds corresponding. So in answer to your question as to their value, I must say that these machines are invaluable.

When you come to carry from eight to ten thousand people per hour on a machine, it obviates all possibility or chance of the machine being installed either for play or for a joke.

I might add with regard to those machines in department stores such as ours, or any similar to ours, that they play just as important a part in the store as does the counter over which the goods are sold. In fact, in any of our big stores it would be impossible to transfer the people from one floor to another without the aid of Escalators.

The store wishing or intending to try to get along without them would find themselves badly handicapped during the busy season.

Respectfully yours,

GREENHUT-SIEGEL COOPER COMPANY,

Wm Hickey

Chief Engineer.

[illegible]

Escalators or Moving Stairways are the most practical way of handling people en-masse—of making each floor or level accessible and usable. Escalators have proved the key to progress where the safe, quick and comfortable handling of large masses of people is concerned, not only in public service stations, but also in the great stores and mills. Escalators have demonstrated that they are indispensable wherever they have been installed. Actual everyday experience for over ten years has shown that Escalators have solved the difficult phase of the transportation problem. Escalators should be in every private and public place where the safe and speedy removal of people from one level to another is a pressing necessity.

Escalators will pay for their cost in the saving of employees' time and energy. Statistics prove that employees climbing old-time stairs so deplete their energy that on an average the first quarter-hour of each individual is a dead loss; whereas using the Escalator each employee is transported quickly, safely, comfortably and without physical effort;—thereby conserving every atom of their energy, saving their time and largely increasing their efficiency.

Running continuously in one direction no time is wasted in stops to load or unload—no power is wasted in intermittent starting and stopping—no operator is required—there are no back-tracks—no discharging and rehandling of passengers—***the movement is continuous.*** It will handle from 6,000 to 11,800 passengers per hour, and keep up this capacity year after year. An electric motor is all that is required for operation, and the current cost, results considered, is relatively small.

Without obligation our Engineering Department will supply full information and submit estimate of installation cost. Correspondence invited.

Otis Elevator Company

Eleventh Avenue and Twenty-Sixth Street, New York

Offices in all Principal Cities of the World

BOOK REVIEWS

HOW TO PLAN A LIBRARY BUILDING FOR LIBRARY WORK, by Charles C. Soule, Boston. The Boston Book Company. Cloth. Price, $2.00.

At last we seem to have presented before us in the seventh volume of the Useful Reference Series, a book which tells us practically everything about library planning. An editorial preface to the work comments on the author's capacity for the work as a competent authority in the field of library building and planning, although a librarian and not an architect. In the author's preface he outlines the following themes of the volume: Pre-eminence of utility over display; the practical nature of library work; the importance and variety of its details; their differentiation from other kinds of work; the vital need of consulting library experts. In the table of contents he epitomizes the book. To comment on the contents of the book in detail is difficult. To generalize, we may say that to the architect planning a library, the information is so essential that we believe he would be foolish to essay his problem without considering the contents of these pages, for so fully into the detail of a library's requirements has the author gone that an architect must needs plead ignorance of his subject if he has not perused its pages. The publishers present an interesting question as to the matter of illustrations. Feeling that the illustration of the book at all required an extensive use of plates, the author has treated the subject in text only and a query blank is sent out with each book requesting the reader's opinion; if he would be interested in a supplementary book of illustrations which the publishers stand ready to prepare if there is a demand for it.

THE ART OF ILLUMINATION, by Louis Bell, Ph.D. Second Edition, thoroughly revised, enlarged and reset. McGraw-Hill Book Company, New York. Cloth. Price, $2.50 net.

The author of this work in his preface comments upon the great advance in the available materials for artificial illumination which have come into use within the last few years. The great advances in the appliances for illuminating purposes have so completely changed the physical aspect of the subject that the thorough revisement, enlarging and resetting of this second edition was necessitated. Both gas and electric illuminants and methods of their use have completely altered in a decade and higher efficiency is to be noted on every side. The principles of illumination have remained the same, and in that portion of the book which deals with photometry there is little change. In the illuminants themselves we find a completely new collection of illustrations and an accompanying text. This work is a technical treatise and it is one for the use of the engineer and the student of lighting. Practical application of theory is of limited extent, but the theory itself is well and thoroughly presented.

KNOTS, SPLICES AND ROPE WORK, by A. Hyatt Verrill, New York. The Norman W. Henley Publishing Co. Price 60 cents.

As is necessary in such a volume, the illustrations are the main feature, as they tell more than a very extensive explanation in the text. There are some 150 illustrations, which show an almost limitless variety of the ordinary knots, splices and fancy knots which may appeal to the amateur yachtsman both as a pasttime and for actual use.

MODERN ILLUMINATION THEORY AND PRACTICE, by Henry C. Horstman and Victor H. Tousley. The Frederick J. Drake Company, Chicago, publishers. Flexible leather. Price, $2.

This work, we believe, will supply the demand for a practical working treatise on the subject of illumination. The efficient use of artificial illumination involves efficiency of the source of light and its application, and also economy in maintenance and operation. This subject has received within the last few years a deservedly careful consideration from engineers who have specialized in the subject and made it a special field of study. This work now presented is intended for the practical workman and it gives sufficient of the theory of illumination to give its users a comprehension of the underlying principles which govern the practical work which they do. This book should be as equally useful to architects and building superintendents as it is to electricians who make it their business to install lighting equipments.

The chapter on plans and specifications should be of use to all, as it gives concisely the elements involved. Among the subjects treated in the chapters of the book are illumination, calculations, characteristics of electrical luminants, shades and reflectors, location and height of lamps, indirect lighting, practical considerations, plans and specifications, illuminating tables and a glossary of terms and phrases.

The chapter on practical considerations deals with the illuminating of apartment buildings, taking them up room by room, art galleries, ball rooms, banks, barber shops, billiard halls, bill boards, churches, department stores, desk lighting, electric signs, factories, hospitals, hotels, libraries, maving picture theatres, outline lighting, saloons, shelving, street lighting, theatres, train lighting and many other special conditions. The suggestions are all valuable and practical.

Art and Architecture

OSCAR WENDEROTH, SUPERVISING ARCHITECT OF THE TREASURY DEPARTMENT.

On June first Mr. Oscar Wenderoth succeeded Mr. James Knox Taylor in the capacity of supervising architect of the Treasury Department, assuming his duties on July 16.

Mr. Wenderoth has had a varied experience in the profession, having been a draughtsman in the offices of various well-known architects of Philadelphia and as a draughtsman for a considerable period in the supervising architect's office. In 1904 he was appointed head draughtsman to the superintendent of the United States Capitol, and was in charge of drawing the plans for several of the new Government buildings. In 1909 he became head draughtsman for Carrere & Hastings in New York, which position he occupied up to the time of the present appointment.

Mr. Wenderoth was born in Philadelphia April 10, 1871, and received his schooling in the Philadelphia grammar schools. At the age of fifteen he took up the study of architecture, beginning as a draughtsman. His present appointment will undoubtedly be approved by American architects.

UNITED STATES CIVIL SERVICE EXAMINATION FOR ENGINEER DRAFTSMAN (MALE). SUPERVISING ARCHITECT'S OFFICE. OCTOBER 16-17, 1912.

The United States Civil Service Commission announces the postponement to October 16-17, 1912, of the open competitive examination for engineer draftsman for men only, announced to be held on September 11-12, 1912, at the places mentioned in their printed list. From the register of eligibles resulting from this examination certification will be made to fill vacancies in the office of the Supervising Architect, Treasury Department, at entrance salaries ranging from $1,600 to $2,000 per annum, and vacancies as they may occur requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

A NEW SCHEDULE OF ARCHITECTS' FEES IN CANADA.

A new schedule of fees has been approved recently for the Province of Quebec Association of Architects. The scedule provides as follows:

No. 8—For professional services in connection with all buildings, comprising preliminary studies, complete plans, specifications, details and superintendence, the architect shall be entitled, except as hereinafter provided, to a commission of five per cent. on the total cost of the building when completed.

No. 9—For all works of addition, alteration, or restoration, the architect shall be entitled to a commission of seven and one-half per cent. on the cost of the works.

No. 10—For all other works of special character, viz.: For monumental work, fittings and furniture, and for decorative work, stained glass and such like, the architect shall be entitled to a commission of ten per cent. on the total cost of the work.

No. 12—Where engineers or other experts are employed by the owner to co-operate with the architect for certain works (as for heating, ventilation, electric work, etc.), the architect shall receive for his commission two and one-half per cent. of the cost of such work.

These are the principal provisions of the new schedule.

THE BURNING OF A COUNTRY HOUSE.

Considerable mention has recently been made in the daily papers of the burning of the residence of Thomas Hastings, of the firm of Carrere & Hastings. This house was at Wheatley Hills, near Roslyn, L. I., and has been variously estimated at a value of $150,000, including the contents.

The contents of the house were very largely salvaged, due to the prompt action of neighbors and servants from surrounding estates. The house, however, which was three stories in height and built of brick, is practically a total loss, despite the fact that the fire department reached the fire in about nine minutes' time. The firemen could do little but watch the house burn, however, as there were no hydrants on the estate, and as there were only a few small and scattered water tanks the hose could not be used.

Our isolated country house presents a fire problem that is often a hard one to solve.

However, we are confident that considerable could be done to ameliorate conditions by the use of chemical extinguishers of the larger portable sizes. The country house owner would do well to give the fire problem a little more serious consideration than he does at the present time, and we have no doubt that he could greatly improve present conditions.

Wm. Leslie Welton, architect, has moved to his new office, 1906-7-8-9 American Trust & Savings Bank Building, Birmingham, Ala. Material men kindly send up to date samples and catalogues for twelve-story fireproof hotel and twenty-story office building.

NEW OFFICIAL BADGE OF THE BUREAU OF BUILDINGS, BOROUGH OF MANHATTAN.

All badges of every description, purporting to represent and to have been issued by authority of this Bureau, or of the old "Building Department" so far as Manhattan Borough is concerned, are hereby recalled and made void; and the adoption and issuance of a new official badge, effective September 3, 1912, is hereby promulgated to all whom it may concern.

All City departments, property owners, agents, tenants, architects and builders are requested to recognize hereafter only such badges of this Bureau as are identical with the careful description herein given (except for variation in the civil service title). The new badge measures two and five-eighth inches high by one and five-eighth inches wide; the capital B is covered with green enamel; the number of the badge is in black enamel; and the framework, the City seal and all lettering are in gold.

These new badges are the property of The City of New York. Hereafter they will be issued only to actual employees of this Bureau, and recalled upon the termination of such employment.

All old badges now outstanding are also the property of The City of New York, and their return to this office for cancellation is hereby requested. The Police, Fire and other City departments are urged to assist this Bureau in reclaiming all these old badges for the protection of the public and the betterment of the service, so that in the future every holder of a Manhattan Building Bureau badge may be held accountable for the use of such authority as the badge may carry with it. Each badge bears an individual number, which is sufficient to identify the holder of record, and all holders of these badges are required to show the same upon request of any citizen. Complaints with reference to any misconduct or misuse of authority by the holder at any time should be addressed to the Superintendent. RUDOLPH P. MILLER,
Superintendent of Buildings.

Dated September 3, 1912.

OBITUARY.

Constant Desire Despradelle, Director of the Department of Architecture of the Massachusetts Institute of Technology, died on September 4th, at his home in Boston after an illness of nearly a year's duration.

Mr. Despradelle, although a Frenchman, was one of the leading men in his profession in America. He was born at Chaumont, France, on May 20, 1862. In 1882 he became a student at the Ecole des Beaux Arts, entering first among 140 candidates for admission. After winning many honors in Paris, he came to the Massachusetts Institute of Technology in 1893.

Mr. Despradelle was a corresponding member of the Institute of France, Academy des Beaux Arts, and had been Vice President of the Societe des Beaux Arts of New York. He was a member of the Boston Society of Architects, and Fellow of the American Institute of Architects.

Fireproofing and Fire-Protection

MR. G. H. STEWART

A REDUCTION IN FIRE LOSS.

At last the fire loss has reached a point of turning as compared with the figures of last year, and the total showing for the first eight months of 1912 is less than the corresponding period in 1911; this despite an enormous handicap during the early part of the year. The fire loss for July was $15,164,100 and for August, this year, $14,158,800, which, added to the total for the previous six months, $134,417,750, gives a total of $163,750,650, which is nearly four millions less than for the corresponding period of 1911 which gave a total of $167,655,550. During the month of August, there were no less than 262 fires, causing an estimated property damage of $10,000 or over in each instance. This list, as compiled and published by the Journal of Commerce and Commercial Bulletin, gives a total of $12,312,000 to which 15 per cent. for small and unreported fires is added according to their methods of compilation, giving the complete total for the month as recorded above. We feel that despite the great loss, which is deplorable in every sense, there is reason for encouragement, for a comparison of the reports made in the April and August issues of *ARCHITECTURE AND BUILDING* shows that the reduction in loss in the last five months has more than made up for the eleven million dollar increase in fire loss which occurred in the first three months of the year 1912.

CHICAGO FIRE PREVENTION.

After considering the subject for nearly a year, the City Council of Chicago has passed an ordinance in which automatic sprinklers are entirely ignored. This is remarkable for two reasons. In the first place, the Council was fully informed by those fire prevention experts who were called in consultation that the automatic sprinkler was the greatest single unit in fire prevention engineering to day. In the second place, they were given more definite information through the medium of the National Fire Protection Association's records and the fact that more than 95 per cent. of the 11,000 odd fires under automatic sprinklers of which this association has records have been either completely put out or prevented from spreading by the action of the sprinklers. It will be recalled that the secretary of the above association recently stated that so far as his records showed, there had never been a single case where a modern equipment of automatic sprinklers had failed to hold a fire from spreading except where the system had been tampered with or the water shut off.

It is supposed that certain business interests were back of the decision of the Council not to recommend or require the use of automatic sprinklers. Similar influences have been noted in the past in which business interests have blocked other public improvements, and it is sincerely to be hoped that when this subject comes up again in October common sense and the results of years of experience in fire prevention engineering will be permitted to dictate the action of the council.

NEW YORK FIRE EXPOSITION.

One of the most unique, and at the same time useful, exhibits at the exposition in Madison Square Garden, October 2 to 12, inclusive, will be that of the General Fire Extinguisher Co. in the shape of a full-sized

(Continued on page 26.)

working model of Grinnell automatic sprinklers. A steel and wired glass house, 10 feet square, has been erected, fitted with a drainage pan at the bottom and provided with one Grinnell sprinkler near the middle of the ceiling. This is connected up by pipe to city water pressure and proper means are taken to carry away the discharge water.

A fire will be built within the enclosure and the spectators around the four sides can get a splendid view of what is going on inside. The heat of the incipient fire fuses the strut in the sprinkler head, and a copious shower of water puts out the fire almost in the twinkling of an eye. This exhibit is to be in operation at intervals throughout each of the ten days during which the exposition will be open.

It is believed that a visual demonstration of this sort will do more to bring to the minds of the general public, and all those interested, the fire-fighting ability of the automatic sprinkler than could be done by reams of paper and gallons of printer's ink. The average man will believe what he sees, but less than half of what he reads or hears. It is for this reason that this particular exhibit ought to attract very wide attention, and should be the means of bringing home to thousands of our citizens the fact that there is at hand an adequate answer to the fire demon.

W. L. FLEISHER & CO. IN THE AUTOMATIC SPRINKLER FIELD.

W. L. Fleisher & Co, Inc., have succeeded to the business in New York of Francis Bros. & Jellett, a well-known concern, who have been pioneers in the sprinkler and steam engineering and contracting business for many years. Mr. W. L. Fleisher, who was for ten years at the head of their New York office, is president of the new company, and since the incorporation and taking over of the business they have been very active in the sprinkler field, not only as contractors, but as engineers.

Among some of the important buildings for which they have either been contractors

(Continued on page 28.)

The Annual Fire Waste in the U. S. exceeds $230,000,000. It is estimated that 75% of this loss is preventable and can be saved by the use of

AUTOMATIC SPRINKLER PROTECTION

Our business is the installation of Automatic Sprinkler protection; a complete fire fighting apparatus, operating automatically and only where the fire is located.

"AUTOMATIC" SPRINKLER CO. OF AMERICA

Executive Offices
123 WILLIAM STREET (Underwriter Bldg.), NEW YORK CITY
Department Offices, in Large Cities

CHEAP AND
EASILY APPLIED

United States Mineral Wool Co.
140 CEDAR STREET, NEW YORK
SAMPLES FREE

S. H. P
Successor
Manu
427 We
Practical demo
March 25th, sho
utilized by Fire
By virtue of c
constant and no
Fire Shutters.

W. L. FLEISHER & CO., Inc.

Succeeding in New York Francis Bros. & Jellett, Inc.

156 FIFTH AVENUE NEW YORK CITY

Engineers and Contractors for the Installation of

AUTOMATIC SPRINKLERS AND FIRE PROTECTION APPARATUS

AGENTS FOR INTERNATIONAL SPRINKLER CO. APPARATUS

or engineers, may be mentioned the following:

Zinn Building, 11th avenue and 25th street.

Otis Building, 11 avenue, 26th to 27th streets.

Loft building, 36-8 West 20th street.

Loft building, 20th to 21st streets and 4th avenue.

Warehouses for Baker & Williams, West 20th and West 12th streets.

Loft Building at 11-13 East 26th street and 8-10 East 27th street.

They are using the International apparatus, for which the old firm of Francis Bros. & Jellett were agents for a good many years, and are among the companies acceptable and favorable to the New York Fire Insurance Exchange and the various mutual companies.

EXHIBIT OF THE AUTOMATIC SPRINKLER COMPANY OF AMERICA.

It is a recognized fact that in any kind of movement for the betterment of mankind, that class of humanity which will benefit most from the improvement is the very last to become enthusiastic, and the fight to overcome this indifference is not the least formidable part of the undertaking. "Indifference" usually means "ignorance," and there are several means of combating it, one of which is by means of reading matter. But by far the best method is practical, visual demonstration, and for this reason the Fire Exposition to be held October 2 to 12 in Madison Square Garden should do much to help along the cause of Fire Prevention.

At this extension the Automatic Sprinkler Company of America will have on exhibition their system of automatic sprinkler protection against fire. Visitors to the exposition may see for themselves the efficiency of this means of fire fighting. If those architects and engineers who are still dubious as to the merits of the automatic sprinkler remain unconvinced, it will not be the fault of the exhibitors. And a great many of those who suffer the most from a large, disastrous fire—the occupants of the building—to many of whom the phrase "automatic sprinkler" is a phrase and nothing more, will have the opportunity to observe the operation of the device and the results of its operation.

U. S. RUBBER BUILDING.

In the U. S. Rubber building, all the walls and ceilings were painted with "Fresco" white paint. This is a flat finish and the results obtained with it in this building were gratifying. The material is made by the De Soto Paint Manufacturing Co. of Memphis, Tenn., and Neven Sparks Lamb, of 149-151 Church St., New York City, is the eastern agent.

Industrial Progress

THE NEW "M'CABE NO. 5" ELEVATOR DOOR HANGER.

The "new idea" in elevator door hangers is designed especially for the highest class work, where quietness, ease of operation and neatness of appearance are telling features.

A sliding bar hanger, with a continuous run of extra heavy track, larger ball-bearings, and covered friction surface all combine to stamp the "McCabe No. 5" as a leader in its line.

The "McCabe No. 5" is an "all-ball" hanger of the latest improved design, presenting many new features not to be found in any other hanger. For instance:

(1) It is practically noiseless.

(2) Friction, and therefore wear, are reduced to a minimum, as the weight of the doors is always evenly distributed on the tracks and all of the balls, thus eliminating entirely the bad effects of the cantilever principle.

(3) Small amount of head room required (about 4½ inches).

(4) Hanger is protected from dirt.

(5) Largest size balls (¾ inch, spaced every 7½ inches apart) used in any hanger.

The workmanship and quality of material in the new "McCabe No. 5" hanger is up to the standard which this company has maintained for the past eighteen years, and we feel very confident in predicting for this high-class hanger a great demand in the future.

(See Advertisement on Page 31.)

TERRA-COTTA CONTRACTS.

The Federal Terra Cotta Company has recently contracted for furnishing the architectural terra cotta to be used in the Biltmore Hotel, being erected in connection with the

(Continued on page 32.)

Grand Central Terminal, on the block covered by 43d-44th streets, Madison and Vanderbilt avenues. The George A. Fuller Co. are the general contractors. This is one of the largest contracts for terra cotta that has ever been placed on a building in New York City. There will be about 2,000 tons of terra cotta in this building.

The Federal Company is also furnishing material for two contracts of equal size, being the Terminal Building for the Detroit River Tunnel Co. in Detroit, Mich., and the Northwestern Mutual Life Building in Milwaukee. Marshall & Fox, of Chicago, are the architects on the latter operation, and the large court of the building is to be entirely erected in granite color terra cotta. The window screens on the front of the building are to be green, and there will also be some red and white glaze terra cotta throughout the building.

The World's Tower Building, a 30-story loft building, now being erected on West 40th street, by Mr. Edward W. Browning, is to be built on all four sides with full white glaze terra cotta, and this material is also being furnished by the Federal Terra Cotta Company.

Some other buildings in the city recently furnished with terra cotta by them are: The Emmet Building, 29th street and Madison avenue; the Eagle Building, 21st street and Fourth avenue, and the Times Annex, West 43d street.

CALCULATION REDUCED TO A SCIENTIFICALLY SIMPLE BASIS.

Although the inventive faculty of man has not yet succeeded in producing a machine which in fineness and breadth of capacity is equal to the human mind, yet many machines have been invented which surpass the human mind in accuracy and tirelessness. This superiority on the part of a machine is particularly noticeable in the field of mathematical calculations, for there is no other field in which the mind of man is so prone to error or so susceptible to fatigue, and when in addition we find this machine to be a compact little masterpiece, weighing only 19 ounces and capable of being carried in one's pocket, we find a remarkably high example of the inventor's art. Such a machine is the "Golden Gem Adding Machine," which is manufactured by the Automatic Adding Machine Company, of 319 Broadway, New York City. As has been said, this little adding machine weighs only 19 ounces, its dimensions are 3x4x⅝ ins., and it is of highly nickel-plated finish. Its inner parts are made of the best steel and brass and each machine is packed in a handsome pebbled morocco case. The operation and method of obtaining results automatically is similar to that of the standard, high-priced calculating machines which are now extensively used by the banks and large corporations everywhere.

This machine is of inestimable value to every person having extensive calculations to make and should be a great help to architects and builders in making estimates and in compiling cost data. It has already obtained a considerable number of users in the building and kindred trades and professions, and is becoming more and more valuable and indispensable to such people because of the variety of purposes to which it can be adapted on account of the compactness of the machine and simplicity of operation. Because of its lightness and compactness, builders should find it very convenient to take to shanties "on the job" to be used in helping to keep count of loads received, wage schedules and for any of the dozens of other occasions when it becomes necessary to engage in extensive calculations.

The manufacturers of the "Golden Gem Adding Machine" are pleased to send the machine upon ten days' trial, knowing that its merits will invariably result in a sale. Information about the "Golden Gem Adding Machine" or literature descriptive of it, may be freely obtained by addressing the Automatic Adding Machine Company at 319 Broadway, New York City.

CEMENT PRODUCTION, CONSUMPTION, EXPORTS AND IMPORTS.

Cement production, consumption and exportation are showing remarkable increases in the statistical records of the United States, as shown by figures of the Bureau of Statistics, Department of Commerce and Labor, while the importation shows an equally remarkable decline. The quantity produced has grown from 8 million barrels in 1890 to 17 million in 1900 and 78 million in 1910, the value having increased from 6 million dollars in 1890 to 13 million in 1900 and 69 million in 1910. Meantime the figures of imports and exports show equally striking changes. The quantity of cement exported has grown from 76,055 barrels (of 380 pounds) in 1900, valued at $163,162,

(Continued on page 34.)

to 2,971,474 barrels in 1911, valued at $4,349,290; while the figures for the nine months ending with March indicate that the total for the fiscal year 1912 will considerably exceed, in both quantity and value, that of 1911 and will probably amount to more than 3 million barrels, or 40 times as much in 1912 as in 1900, with a value of more than 5 million dollars, as against $163,162 in 1900. On the import side the decline has been as rapid and striking as the increase on the export side. The quantity of cement imported in 1907 was 1,123,763,604 pounds, but by 1911 had fallen to 93,297,749 pounds, and in the fiscal year 1912 seems likely to fall below 50 million pounds, or less than one-twentieth of the imports of 1907.

The United States is apparently leading the world in the production of cement for industrial purposes. The latest figures available in the Bureau of Statistics with reference to production in various parts of the world places the production in Germany at about 30 million barrels, or considerably less than half that of the United States, and that of England, slightly less than 20 million barrels. Of the 78 million barrels produced in the United States in 1910 a very large proportion was cosumed at home, the exports for that year being but about 2½ million barrels. The total consumption in the United States, according to the best available figures, has grown from about 20 million barrels in 1900 to 74 million in 1910.

The cement industry, according to the census of 1910, showed number of establishments, 135; capital invested, $187,398,000; number of wage earners, 26,775; wages paid, $15,320,000; cost of materials, $29,344,000; value of products, $63,205,000; value added by manufacture (value of products less cost of materials), $33,861,000.

PITTSBURG'S "HUMP."

When Pittsburg authorized a bond issue of $750,000 to cut away the "hump" it was with the view of eliminating an obstacle which has long interfered with the handling of traffic between the low-lying business section of the city and the residential districts. The work is now under way, but the cost above stated is but a fraction of what will be expended in completing this improvement. A few of Pitts-

(Continued on page 36.)

burg's large buildings were built with the idea of complying with the proposed new grades of the streets, but scores of structures will require complete overhauling and many will be razed and the sites rebuilt. It will mean the rebuilding of practically twenty blocks of Pittsburg's downtown business section, and that there will be ten million dollars' worth of new fireproof buildings in Pittsburg within the next two years is a safe estimate.

Some of the buildings, such as the Frick Building, Carnegie Building, the new Hotel Henry, Kaufmann Brothers' department store and the Allegheny County courthouse, were designed to meet the new grades, but all around and about them changes are required. We may look for rapid and extensive changes in Pittsburgh's skyline.

A new structure is proposed by Mr. H. C. Frick to occupy the site of the old St. Paul's Cathedral, but it is yet undecided whether it will be a twenty-five or thirty story office building, or a modern hotel.

Beside the business construction, work is constantly going forward in the new steel and brick and terra cotta buildings for the University of Pittsburg's new group at an outlay of $8,250,000, and new buildings for the Carnegie Institute of Technology group. The latter have cost $11,000,000, and as much more is to be spent. These educational buildings are in the civic center in the Oakland residential district, where in the past two years such structures have gone up as the million dollar Pittsburg Athletic Association clubhouse, the $2,250,000 Soldiers and Sailors' Memorial Hall, the National Guard armory and other lesser structures, in keeping architecturally with the Carnegie Institute, completed several years ago at a cost of more than $6,000,000.

The National State Bank of Newark, N. J., was built by W. H. Fissell & Co. The illustrations on pages 378-380 show exterior and interior views of the building. The bank is beautifully illuminated at night by bronze standards carrying arc lights along the front, and it is a fitting addition to Newark's "White Way." The Browe Company made the lighting fixtures.

A most interesting point in the interior finish is the flooring which, with the exception of a portion of the first floor, is entirely of "Kompolite," a composition flooring manufactured by the General Kompolite Co., and which is an almost ideal material for the purpose. The Atchison Revolving Door Co. installed the curved wing revolving doors, one of which opens into the main hallway and the other into the banking room. The Fitzgerald-Speer Co. did the mill work, and the fireproof doors and windows were made by the Leonard Sheet Metal Works.

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Elevator shaft construction in buildings has never before been technically treated. This book supplies the demand for information on this subject, and it has been the effort of the author to supply the necessary data for the use of the architect in placing an elevator equipment in any building. New York practice is followed, and the Building Department laws and regulations of New York are made the standard. The author has also made a careful study of the regulations in use elsewhere, giving the deviations from New York requirements. Specification writing for elevator equipment has been covered by two forms; one a simple specification for a single elevator, the other a more elaborate equipment embracing several styles of cars suitable for an office building.

The book contains most practical information and it is the hope of the author that he has omitted no important point. Every phase of the shaft problem in building construction has been covered, and the method of presentation is such that ready reference is possible to any detail of the subject.

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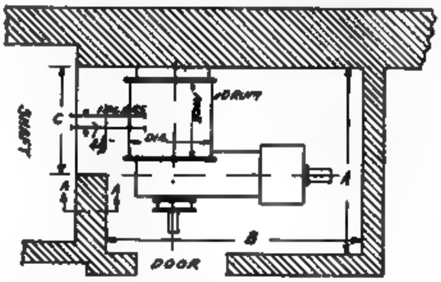

Plan of a Machine Room

Architecture and Building

Established 1882 — *A continuation of the Architect's and Builder's Magazine, 1899-1911* — Continued 1911

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CONTENTS FOR OCTOBER

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ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

Volume XLIV. OCTOBER, 1912 *Number 10*

THE HOTEL COPLEY-PLAZA, BOSTON, MASS.

HENRY J. HARDENBERGH, Architect

FACING Copley Square, Boston, taking a place in the architectural group formed by Richardson's Trinity Church and the equally famous Public Library building, the Hotel Copley-Plaza presents a long low frontage of seven story height, making no interruption of the skyline which has been so wisely set at 90 feet by the Boston Fathers. This Renaissance pile done in light brick with terra-cotta trimmings has a façade made interesting by a great central bay, an interruption which lends attraction to what might have been otherwise a barren expanse.

The decoration of the interior is well portrayed by illustrations, and the arrangement of the rooms shown by the plans. The typical floor plan is like a gigantic E, with elevators and stairs in two shafts in the two outside wings leading from the main concourse and the side entrances of the ground story, and another elevator at the front leading from the Copley Square entrance. There are 500 rooms for guests and private bathrooms for all bedrooms.

All the public rooms of the hotel are in the ground story and basement, as may be seen by the plans. These rooms, as well as other important rooms of the ground story, are of extra height, the space intervening about their upper portions being occupied by a mezzanine story.

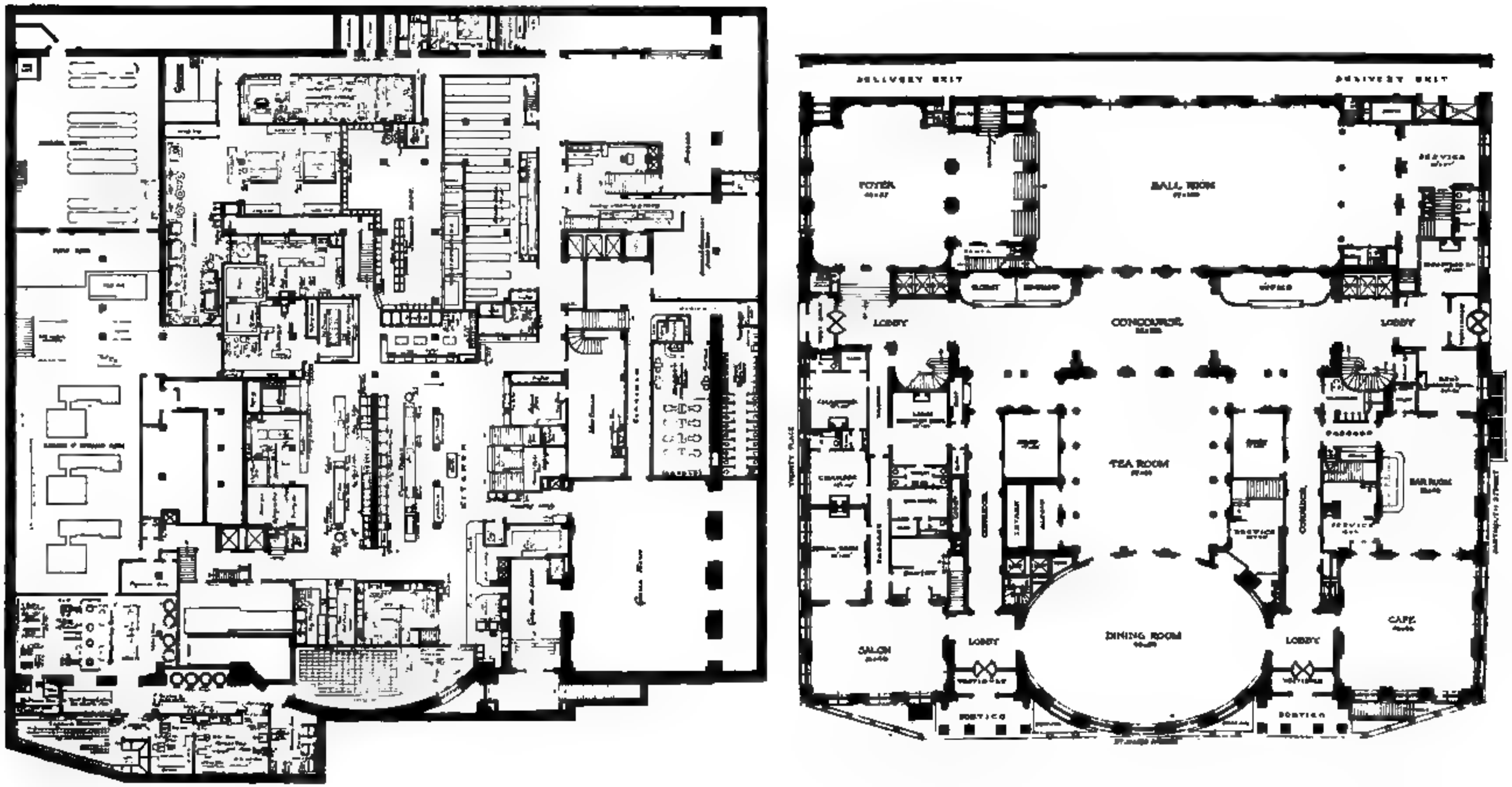
Built on soft ground, the building foundations rest on about 6,000 piles, driven to a depth of nearly 70 feet below street level. The building is of the usual steel frame construction, fireproofed with terra-cotta, which is also used for the floor construction. The exterior walls are bearing walls and all interior partitions are of hollow terra-cotta blocks. The stairs and elevators are carried in fireproof shafts, separated from the corridors by kalameined doors on all floors occupied by guest chambers.

The floor surfaces of all bedrooms are cement and those of the corridors and stairs are terrazzo and marble. All trim and doors except as before mentioned are of wood.

Aside from efficient planning and fireproof construction, the modern hotel has become a possibility only by the completeness of its service and mechanical equipment. Moreover, upon efficient and economical service and operation of the mechanical plant depend the profits of the hotel. The service of the Copley-Plaza is concentrated in one large basement which contains the power plant, kitchens, laundries, storerooms, etc.

POWER PLANT.

Power plant is developed by a battery of four high-pressure, Babcock and Wilcox boilers, aggregating 1,326 H. P. These are equipped with Wilkinson automatic stokers which are filled with coal by gravity direct from coal cars on a firing platform above. These boilers



HOTEL COPLEY-PLAZA. PLANS OF THE BASEMENT AND GROUND STORY.

Henry J. Hardenbergh, Architect.

THE HOTEL COPLEY-PLAZA, BOSTON, MASS.

Builders: George A Fuller Company.
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C O. Mailloux, } Consulting
C. E Knox, } Electrical Engineers.

furnish steam for the engines and also for the heating system and all steam used for other purposes. The electrical power plant consists of three direct-connected units, two of 300 kilowatt and one of 200 kilowatt capacity. The engines are of low-speed, releasing Corliss type and are provided with efficient and sensitive governors and safety stops which act automatically in case an engine attains a speed of 10 per cent. above its rated speed, and which may be operated by a push button at any time, to instantly stop the engines. The generators are of the three-wire, external compensator type. The engines are equipped with very heavy fly wheels so as to make possible the use of a single unit to supply both lighting and elevator circuits without undue fluctuation in the voltage.

HEATING AND VENTILATING.

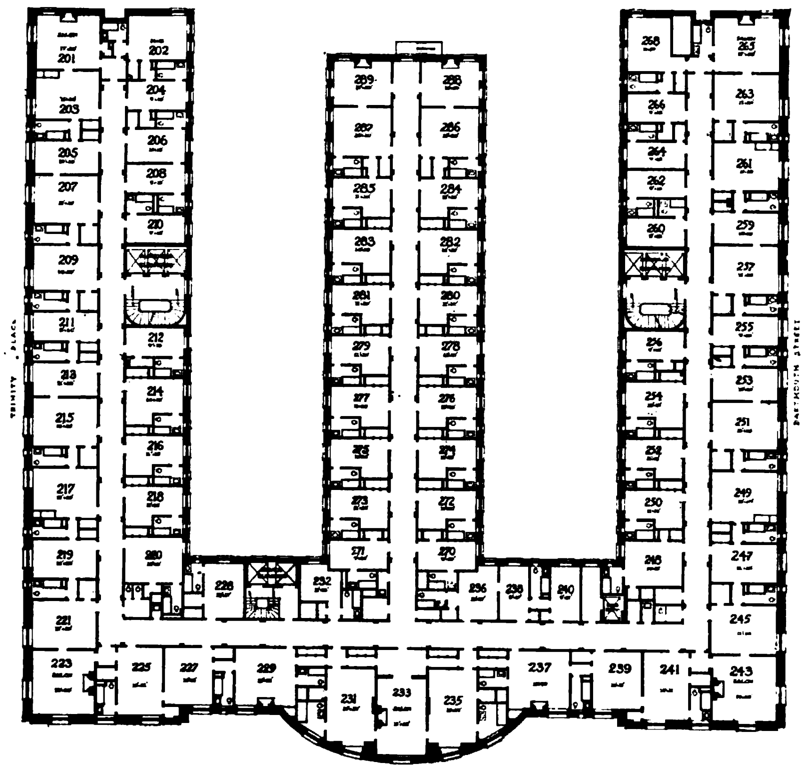
The heating and ventilating equipments are closely combined. Exhaust steam is regularly used for heat except in the very coldest weather. The temperature is controlled by Johnson temperature regulation, and the return accelerated by a Webster vacuum system. All steam risers and returns are concealed back of furring, and all radiator connections are run below the finished floors. The radiators are also screened-in and concealed. All steam piping is very thoroughly insulated with magnesia covering and the ceilings of the engine and boiler rooms are covered with magnesia blocks so as to insulate them and prevent undue heating in the public rooms in the ground story above. Natural ventilation under normal conditions has been taken advantage of to the utmost throughout the public rooms of the ground story. However, there is mechanical ventilating apparatus in all these rooms to meet unfavorable weather conditions, or conditions arising from large assemblages of people. Mechanical ventilation is also provided for the boiler and engine rooms, the kitchen and service portions, both in the basement and the ground story.

For the mechanical system, fresh air is drawn down from the court through a shaft having a cross-sectional area of 161 square feet, to a ventilating chamber where dust particles are removed by cheese cloth screens. The air is then tempered when necessary in winter time by being drawn over steam coils, the temperature of which is automatically controlled by thermostats and maintained at the desired degree. The air is then forced by fans through iron ducts which are covered with non-conducting material, and distributed to the various rooms through registers; 40,000 cubic feet of air per minute is forced into the ball room and its foyer alone, and an equal amount is supplied to the remaining rooms of the ground story. A third fan supplies 30,000 cubic feet of fresh air to the public rooms of the basement. For the ventilation of the service portion of the basement, 75,000 cubic feet of cooled air per minute is required.

Air is exhausted by five disk fans in roof houses, which is drawn by ducts from the public rooms of the ground story. A sixth fan exhausts air in a similar manner from the toilets, slop sinks, etc., in the upper stories. Steel plate centrifugal fans located in the basement exhaust air from the service portions and discharge it through ducts above the roof. All fans are driven by direct-connected electric motors. In the ballroom. the air supply normally enters openings near the ceiling and is exhausted near the floor, but by a simple arrangement of the supply ducts and a reversing damper. the direction of this supply and exhaust may be reversed.

SANITATION AND WATER SUPPLY.

A reference to the typical floor plan shows the location of the various toilets. The water supply and soil lines are all



PLAN OF TYPICAL UPPER STORY.
Henry J. Hardenbergh, Architect.

carried in chases which are readily accessible. All house drainage runs directly to the sewer, but the basement waste draining to a level below the city sewers is disposed of by three Shone ejectors with a capacity of 100 gallons per minute. The water supply is circulated by city high pressure service. There are five double-cylinder Loomis-Manning filters through which all water passes. The water for drinking purposes is refiltered through compound Buhring filters located in the kitchen, serving pantries and bar. The hot water supply for the house is heated by three Davis hot water service heaters. These are operated by exhaust steam at 2 pounds pressure, and have a capacity of raising water from 45 to 160 degrees. The water for the hot water service comes from a supply tank on the roof, which normally receives water from a suction tank receiving the water from the condensing coils of the refrigerating plant. When this supply is insufficient, cold water is automatically supplied to this tank. The hot water supply to the various fixtures throughout the house is piped on a circulating system. A main riser comes from the hot water heaters to distributing pipes at the top of the house. From this, down feeders lead to all the fixtures and to return pipes leading to the heaters in the basement, where it is reheated and continued in circulation.

ELEVATORS AND MECHANICAL EQUIPMENT.

The elevator equipment in the building consists of six passenger elevators grouped in two batteries, and three service elevators. The machines are the A. B. See overhead worm gear, traction type. They have a capacity of 2,500

HOTEL COPLEY-PLAZA. THE LOBBY

Henry J. Hardenbergh, Architect.

Marble and Mosaics: Batterson & Eisele.
Bulletin Board: U. S. Changeable Sign Co.
A. B. See Electric Elevators.
Leaded Glass: Henderson Bros.

HOTEL COPLEY-PLAZA. CORRIDOR AND DETAIL OF MAIN DINING ROOM.

Ornamental Plaster: McNulty Bros. Inc.
Panelboards and Switches: Metropolitan Electric Mfg. Co.
Furniture: Pooley Furniture Co.
Metal Glazing: Henderson Bros.

Henry J Hardenbergh, Architect.

HOTEL COPLEY-PLAZA. MAIN DINING ROOM.

Henry J. Hardenbergh, Architect.

Silver Service. The Gorham Co.
Furniture: Pooley Furniture Co.
Ornamental Plaster, McNulty Bros. Inc.
Loomis-Manning Water Filters.

HOTEL COPLEY-PLAZA. THE TEA ROOM.
Flower Urns: The Erkins Studios. Henry J. Hardenbergh, Architect
Leaded Glass: Henderson Bros. Evans' "Crescent" Expansion Bolts Used.

pounds at a speed of 400 feet per minute. There are two baggage lifts and an ash hoist running from the basement to the street level, and a number of electric dumbwaiters operating on push button control for service between the basement and the first floor.

A complete system of house telephones is installed, with an instrument in every room, which communicates to a central switchboard on the ground floor. This provides for the outside calls of guests and also for all orders from the guest rooms.

There are two laundries shown by the basement plan. One for flat work is for the house service, and is equipped with six washers, three extractors, two mangles and one dryer, besides other minor machinery. The guests' laundry for bundle work, which is done by hand, is also shown on the plan.

There is a complete vacuum cleaning equipment, piped throughout the building. The machine is a twelve-sweeper, aspirator equipment, which works on the principal of a steam inspirator.

RESTAURANT SERVICE.

The direct service of the house, with the various machinery pertaining thereto, is very well developed. The plan of the basement shows the location of the kitchen, and a reference to the ground floor plan shows the connection of the kitchen to the various serving pantries provided for the dining room. For the service of the main dining room and the tea room there is a serving room in the ground story which adjoins these two rooms and is connected with the kitchen

HOTEL COPLEY-PLAZA. THE BALL ROOM.

Henry J. Hardenbergh, Architect.

Lighting Fixtures: Pettingell-Andrews Co.
Ornamental Plaster: McNulty Bros. Inc.
Bentwood Chairs: Jacob & Josef Kohn.
Ornamental Iron and Bronze: The Winslow Bros. Company.

HOTEL COPLEY-PLAZA. DOORWAY IN THE BALL ROOM.

Interior Woodwork, Matthews Bros. Mfg. Co. Henry J. Hardenbergh, Architect.
Bentwood Chairs: Jacob & Josef Kohn.
Corbin Hardware.

HOTEL COPLEY-PLAZA. DETAIL OF BANQUET ROOM.

Henry J Hardenbergh, Architect

Keystona Flat Finish Used.
Bentwood Chairs: Jacob & Josef Kohn
Lighting Fixtures: Pettingell-Andrews Co.
Ornamental Metal Mirrors: Henderson Bros.
Corbin Hardware.

by a wide flight of stairs. The checker's desk is located at the foot of the stairs, which open directly into the kitchen before the cooks' tables. For the service of the grill and barroom there is a separate service room in the ground story and a grill pantry in the basement. The connection between these two pantries is by means of a large automatic dumbwaiter and by a flight of stairs leading to the kitchen. There is a serving room for the salon, and one for the ballroom, each of which have connecting pantries in the basement, with flights of stairs leading from these pantries in each case. The location of the ranges, pastry ovens and other appurtenances of the kitchen are clearly shown in the plan. Two portions of the mechanical equipment come into play particularly in connection with the kitchen and restaurant service, namely, refrigeration and steam warmers.

For refrigeration there are two York ammonia compression machines of 30 tons capacity. These supply chilled brine to the coils of 29 refrigerators located in various parts of the kitchen and serving pantries, and bar of the ground story, and also provide refrigeration for an ice-making plant.

Steam is piped to various warmers throughout the kitchen and ground story serving rooms.

Guests are served in their rooms directly from the kitchen by means of two of the service elevators previously mentioned and plainly shown on the plans. The orders are brought directly from the kitchen by means of these elevators to the particular floor and room. This system is economically possible in this building because of its few stories.

HOUSE SERVICE.

Under this head we may group maid

HOTEL COPLEY-PLAZA. THE BAR ROOM.

Marble and Mosaic: Batterson & Eisele.
Ornamental Plaster: McNulty Bros. Inc.
A. B. See Electric Dumbwaiters.

Henry J. Hardenbergh, Architect.

HOTEL COPLEY-PLAZA. LADIES' RECEPTION ROOM AND A BEDROOM.

Interior Woodwork: Matthews Bros. Mfg. Co.
Keystona Flat Finish Used.
Vacuum Cleaner: Sanitary Dust Removing Co.
Furniture: Pooley Furniture Co.
Lighting Fixtures: Pettingell-Andrews Co.
Corbin Hardware.

Henry J. Hardenbergh, Architect.

service, watchman service, and the means of communication, and distributing orders of guests. The maids who take care of the rooms and on occasion serve the guests are at all times distributed about the hotel, and to provide a means of communication with them a maids' annunciator system has been installed. Outside of the door of every guest room there is a plate into which, on entering the room, the maid plugs in a portable light. This light indicates to the matron in charge of the floor the location of each maid on that floor, and at the same time that the signal is plugged in a light is shown on an annunciator in the main office, thus giving at all times the location of each maid in the house. Communication can then be had with the maid by means of the telephone in the room.

All orders from guests may be communicated by telephone to the main office, where they are made out and delivered by a pneumatic tube to the kitchen, bar, or elsewhere. There are also pneumatic tube stations on every floor, from which waiters serving meals in rooms may transmit orders directly to the kitchen for filling.

The watchman's system consists of station boxes of the magneto type located on the various floors, which register the time and place of the watchman on a dial in the chief engineer's office. There are over thirty stations on this system, which was installed by The Holtzer-Cabot Electric Company.

An automatic clock system is wired throughout the building by means of which clocks in all the parlors and in the public rooms and service departments of the hotel are automatically regulated.

FIRE PREVENTION.

There are fire alarm boxes on every floor, with fire bells located throughout the building. The first signal from an alarm box goes to the hotel office and the chief engineer's office, and also rings in the service elevators. The operators upon receiving the fire signal immediately lower the elevators to the basement, get the house fire-fighting force

HOTEL COPLEY-PLAZA. THE BARBER SHOP.
Henry J. Hardenbergh, Architect.
Basement Provided with Grinnell Automatic Sprinkler Equipment.

and take them directly to the floor from which the alarm was sounded.

Outside alarm to the public department is given from the hotel office, and the general alarm throughout the hotel is also sounded from this point. As previously mentioned, the stair and elevator shafts are practically fire towers, but in addition to this there is an outside fire escape on the central wing. The house fire equipment consists of hand extinguishers located about the upper floor corridors, and there are four lines of standpipes provided with 75 feet of hose on open reels. The water supply is from the high pressure street mains. Moreover, the entire basement, kitchen, pantries and storerooms, the portions in which a fire is most likely to originate, are protected with Grinnel automatic sprinklers, receiving their water supply from the high pressure street service.

The George A. Fuller Company built the Copley-Plaza. C. O. Mailloux and C. E. Knox were the consulting electrical engineers, and Nygren, Tenney & Ohmes were consulting engineers for the heating and ventilating. Dixon's silica graphite paint was used on the steel work. The masonry work was damp-proofed and stain-proofed with R. I. W. paints. American enameled brick was used for linings in the boiler rooms.

The Winslow Brothers Company did the ornamental iron and bronze work. The interior woodwork was done by the Matthews Brothers Manufacturing Company. Batterson & Eisele did the marble work and mosaics. McNulty Brothers did the ornamental plaster. Henderson Brothers put in the mirrors and leaded glass, and Keystona flat finish was used on the walls.

The plumbing was done by the W. G. Cornell Company, and the vacuum cleaner was put in by the Sanitary Dust Removing Company. The Metropolitan Electric Manufacturing Company supplied panel boards and their detachable mechanism flush switches. The lighting fixtures were planned, designed and installed by the Pettingell-Andrews Company, and are in keeping with the architectural spirit of the rooms in which they are placed. Direct-indirect lighting is employed in the foyer, dining room, tea room and some other portions of the ground story, using lamps with special reflectors placed back of non-absorptive diffusing glass. This system was evolved by the architects with the collaboration of Mr. C. E. Knox.

The Pooley Furniture Company supplied the furniture for the hotel, a very beautiful and elaborate equipment. Bentwood chairs were furnished by Jacob and Josef Kohn. The Erkins Studios supplied the cement stone flower urns in the tea room. The silver service for the hotel was designed by the Gorham Company.

SILVER SERVICE PRODUCED BY THE GORHAM COMPANY FOR THE COPLEY-PLAZA.

BETHLEHEM CHAPEL. THE SOUTH PASSAGE AND SACRISTY.
Cut Stone Contractors: E. F. Giberson & Co. Henry Vaughan, Architect.

THE BETHLEHEM CHAPEL

Cathedral Church of St. Peter and St. Paul, Washington, D. C.

HENRY VAUGHAN, Architect

THE Bethlehem Chapel of Holy Nativity of Washington Cathedral was a project formed by Bishop Satterlee during the last years of his life, and after his death the project was carried out and the chapel built as a memorial to the first bishop of Washington,

The chapel, which is a crypt, is placed beneath the high altar of the Cathedral, as Bishop Satterlee had planned it, and the foundation stone of the choir of the Cathedral forms the sub-structure upon which the Bethlehem Chapel is built. Owing to the lay of the land and the sloping nature of the site, the crypt is almost entirely above ground, with well lighted windows. As originally planned by Bishop Satterlee, the architecture of the chapel was in the Norman style, with massive pillars and round arches, divided interiorally into three aisles similar in size and proportion to those of the Norman churches of Europe, and with a capacity for seating about three hundred persons.

When the architect and the Chapter of Washington Cathedral came to the planning of the chapel, however, it was found necessary to depart somewhat from this original plan. The round Norman arch, it was thought, would give too low a vault and would be depressing in effect. The Norman windows on the exterior were out of harmony with the Gothic architecture of the remainder of the Cathedral, and on the other hand, Gothic windows, if used for the chapel, would be out of keeping with Norman features of the interior.

Under these conditions the Norman style for the chapel was abandoned, and the decorated Gothic of the Fourteenth Century, which is the architectural style of the Cathedral, was adopted in its stead. The seating capacity was increased to about five hundred.

While the exterior of the Chapel conforms as a whole to that of the Cathedral, the architect has allowed himself

ADORATION OF THE MAGI.
Portion of Window in the Apse of Bethlehem Chapel
Windows: C E. Kempe & Co.

BETHLEHEM CHAPEL. SOUTH AISLE, LOOKING EASTWARD.
Cut Stone Contractors: E. F. Giberson & Co. Henry Vaughan, Architect.

BETHLEHEM CHAPEL. THE ORGAN.

Woodwork and Choir Stalls: Irving & Casson. Henry Vaughan, Architect.

BETHLEHEM CHAPEL. THE ALTAR.
Cut Stone Contractors: E. F. Giberson & Co. Henry Vaughan, Architect.
Woodwork and Choir Stalls: Irving & Casson

BETHLEHEM CHAPEL. THE NORTH AISLE, LOOKING WESTWARD FROM THE CHANCEL.

Star Expanion Bolts Used. Henry Vaughan, Architect.

more latitude in the decoration and arrangement of the interior. The nave is severely simple, resembling somewhat the transitional Norman from which the Gothic developed. The chancel is richly decorated with the purest Gothic ornament. In fact there is much more ornament in the chapel than will appear in the great Cathedral above. In the vaulted niche behind the reredos of the chapel and under the altar of the Cathedral a tomb has been prepared which will be final resting place of Bishop Satterlee. The Chapel has been so orientated that on May 4th, the traditional date of the Ascension of our Lord, the sun will shine directly through the east window and fall upon the sepulchre.

The foundations of Bethlehem Chapel are upon a compact bed of cemented gravel which forms an excellent support for the heavy walls and towers. The footings are of concrete carried down to a depth of 19 feet below the level of the chapel floor, 29 feet below the ground level at the west end of the chapel, and extending 24 feet under the main walls of the Chapel and Cathedral. The excavated spaces between the footings have been enclosed and are used for air ducts, heating chambers and a burial vault.

The floor is of reinforced concrete, surfaced with marble 2 inches thick. The walls are of solid masonry, hard burned brick laid in cement mortar, 8½ feet in thickness in the main walls and 6½ feet in the walls outside of the vestries. They are faced inside and out with Indiana limestone in sandrubbed finish, the facing being 12 inches and 16 inches in alternate courses. Although the regular shaped stone was cut and dressed by machinery at the quarries, in laying the courses the vertical joints were broken, no one coming directly above another in any course, in imitation of the work in old cathedrals of Europe, where each stone was cut and dressed at the site as required. This Indiana limestone, which is of very even texture and beautifully finished, was supplied by the cut stone contractors, E. F. Giberson & Company.

In the apse end there are five large window openings, the full height of the chapel. The jambs of these windows are slightly flaring, displaying the thickness of the wall. The five apse windows consist of four panels each, with tracery above. The picture of the most northerly window shows the Genealogy of our Lord. The next one is the Gloria in Excelsis. The centre and most easterly window is the Annunciation. The fourth window is the Epiphany, and the most southerly window is the Nunc Dimittis. There are other beautiful windows placed over the doorways and elsewhere in the chapel representing other subjects connected with Christ's Nativity. In the designs the devotional effect of the great mediæval windows is well combined with the more perfect drawing characteristic of the modern phase of this art. These were all designed by Mr. Walter E. Tower, of Kempe and Company. In the nave the wall pillars which support the roof divide the north and south walls into five bays each. On the west wall of the chapel the central arch of three divisions extends the full height of the nave and is occupied by the organ.

The doors are of oak in natural finish, of simple design and substantial construction. They are hung directly to the stone work by ornamental iron hinges. The woodwork and choir stalls were produced by Irving and Casson.

The chapel is lighted by clusters of six Tungsten bulbs in each alternate section of the vaulted ceiling, concealed in carved alabaster bowls through which the light is diffused. The globes are suspended from the ceiling by ornamental bronze chains.

STANDPIPE AND HOSE SYSTEM IN BUILDINGS

Being Portions of the Report of the Committee on Standards of the National Fire Protective Association

PART III.

W. C. ROBINSON, Chairman

THE following portion of Mr. Robinson's report deals with the maintenance of a standpipe system. When a system has been properly installed it should be kept at highest efficiency. This is the last article, and is the concluding portion of Mr. Robinson's report.

MAINTENANCE.

The strength of standpipe and hose systems, like that of other fire protection equipments, is dependent on the strength of its weakest link. These systems are normally inert, and, unlike other apparatus and machinery, the use of buildings or the operation of plants is not directly dependent on their being maintained in operative condition. As a consequence, cheap and unsuitable equipment, difficult to maintain, is usually installed, and systems are frequently neglected and allowed to become unreliable or inoperative. Obviously, the trouble and cost of maintenance are inverse functions of the suitability of the materials and devices for the service and the thoroughness with which they are installed. The most careful attention is necessary in the selection and installation of the devices and materials, for a strong simple standpipe system requiring a minimum of attendance and maintenance is essential.

The entire system of piping up to and including the hose valves should be thoroughly tested out under a pressure of at least 300 pounds to the square inch at the lower story. Where systems are to be installed in extremely high buildings or used in connection with high pressure mains they should be tested out under higher pressures. Ample factors of safety should be provided in all parts of the system.

Particular attention should be given to the condition of the hose valves, as they are frequently the greatest source of annoyance and expense. They should be carefully examined at least once a year to see that they are operative and in regard to their tightness. If found to be unreliable they should be replaced, as an inoperative valve may defeat the object of the entire system and leakage will rot the hose and render it unreliable. In a properly equipped system, leakage may be detected by inspection of the drip cocks at the valves, and a general check on their tightness may be secured by locating the open end of the main drain in the engine room, or at a point where the discharge of water from it can easily be observed.

If the hose valves are in locations where they are apt to be molested they should be equipped with guards which will prevent tampering, but which can be broken open in case of fire.

The hose is probably the most perishable part of the system, but if the best grade of linen hose is employed and given proper care, its lasting qualities will be in excess of twenty years. Water should never be turned into linen hose, or the hose wetted unless it is necessary to use it in case of fire, after which it should be thoroughly dried out before it is reracked. Hose subject to dripping or excessive moisture should be protected by coverings. Unlike cotton rubber-lined hose, running water through linen hose acts to reduce its lasting qualities.

The hose should be stored on racks, but it is probably advisable to remove it at intervals and rerack it, with the folds in different places. Where private fire departments are maintained, practice drills should include laying the hose without turning on the water. Extra hose should be provided for drilling the men in the handling of fire streams.

Fire hose should be uncoupled at intervals and new gaskets installed in the couplings, both at the hose valves and at the play pipes and nozzles.

The system should be under constant pressure through full open connections to the water supplies for the first aid streams. The proper maintenance of the water supplies can usually be made almost incidental to the upkeep of other necessary parts of modern building or plant equipment.

Systematic periodical inspection of all portions of standpipe systems is essential,

and employees to whom this duty is intrusted should be held strictly responsible for their condition.

A thoroughly trustworthy standpipe and hose system will naturally appeal to those who must spend a large proportion of their time under its protection, particularly so in high buildings and buildings from which escape at time of fire is manifestly difficult. Full appreciation of the value of such systems for the protection of life and property against fire will undoubtedly result in a more systematic drilling of employees in the handling of fire apparatus and the more extensive establishment of trained private fire departments. The members of such organizations will gain confidence in their own ability to extinguish fire and, if properly organized and instructed, will undoubtedly take pride in their share of the maintenance of the standpipe and hose system.

The standpipe and hose system must necessarily lack the essential qualification responsible for the success of the automatic sprinkler system, namely, the automatic application of water to the seat of fire, regardless of the locality at which the fire may start within the building. It is also lacking as regards its reliability of application to fire under all conditions. At the same time, the standpipe and hose system furnishes the closest possible approximation to the standard of efficiency in fire extinguishment set by the automatic sprinkler. Its use as essential to the proper protection of present day buildings against fire. Its general application to buildings in congested city districts, particularly where the buildings are high, will greatly increase the fire department facilities and very materially decrease the conflagration hazard.

In the foregoing your committee has attempted to outline the essential requirements for a standpipe and hose system which will prove efficient, reliable and safe in the hands of all who may be expected to handle it. If designed, installed and maintained as indicated, the system provides the means for the extinguishment of fire during its incipient stages; for the control of fire in its more advanced stages on the interior and exterior of buildings, and for the heavier fire stream service of long duration often necessary in fighting fires in nearby buildings, particularly at the higher levels. The system is ready for instant use and is so equipped that it need only be provided with the men to operate it.

The committee sincerely trusts that this will be a prominent subject in the deliberations of the association until all of the problems it presents are properly solved and a comprehensive standard is adopted.

WINDOW OVER DOOR OF SOUTH PORCH OF THE BETHLEHEM CHAPEL.
Zacharias Naming His Son Saint John The Baptist.
Windows: C. E. Kempe & Co.,

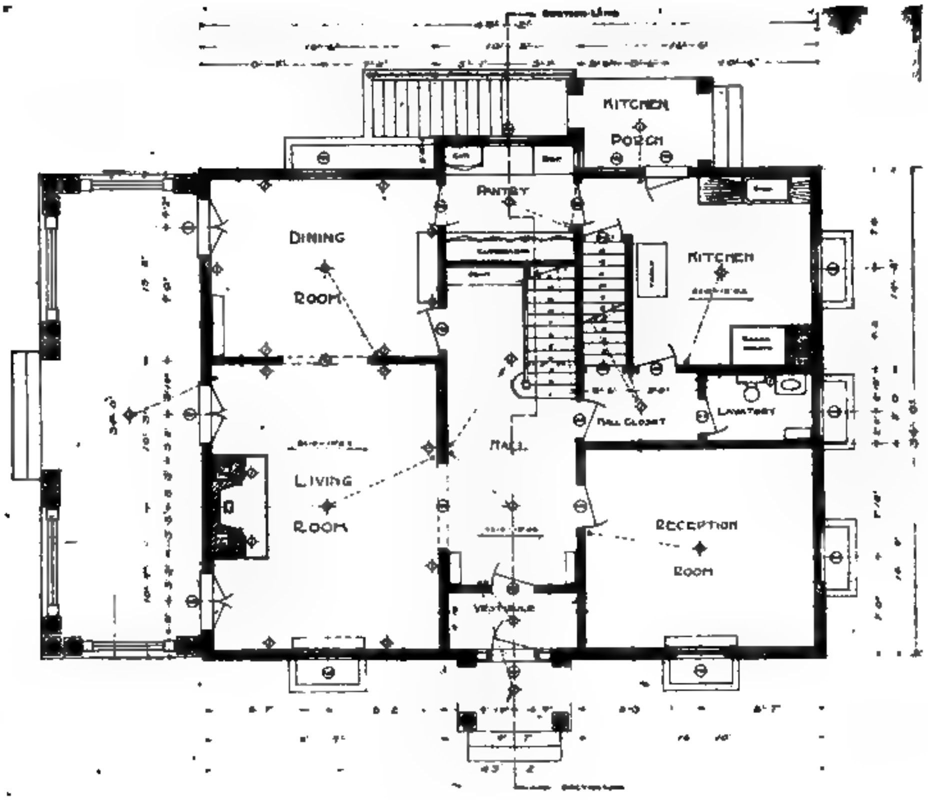
Front Elevation.

Left End Elevation.

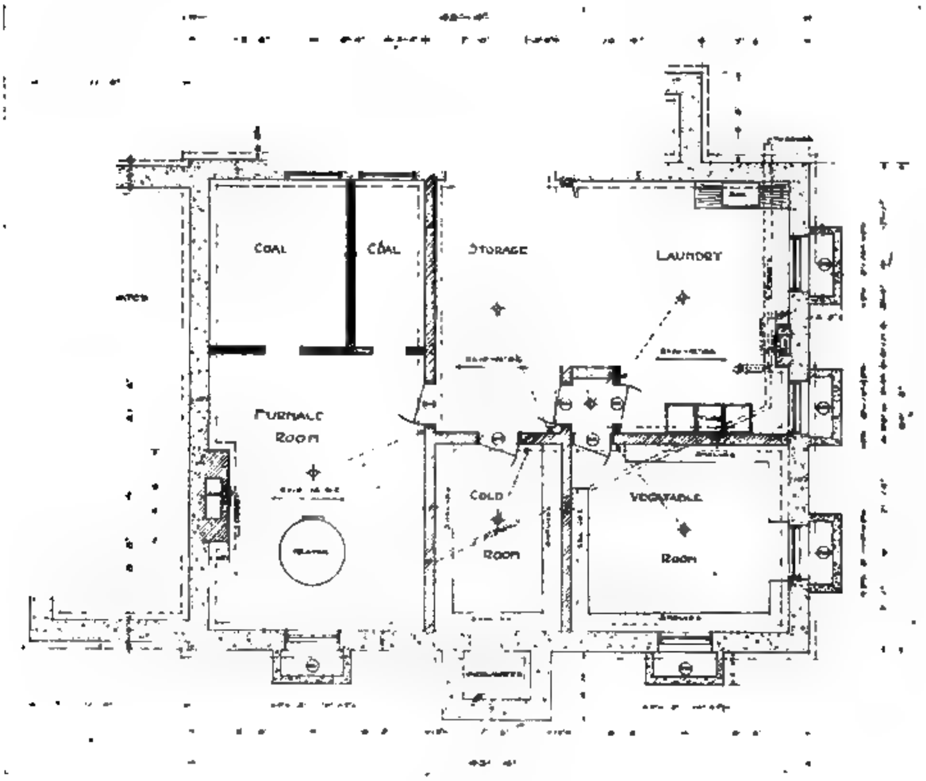
A SMALL COUNTRY HOUSE. WEST HILL, ITHACA, N. Y.

H. W. Keil, Architect.

Students' Working Drawings, Cornell University, College of Architecture.



First Floor Plan

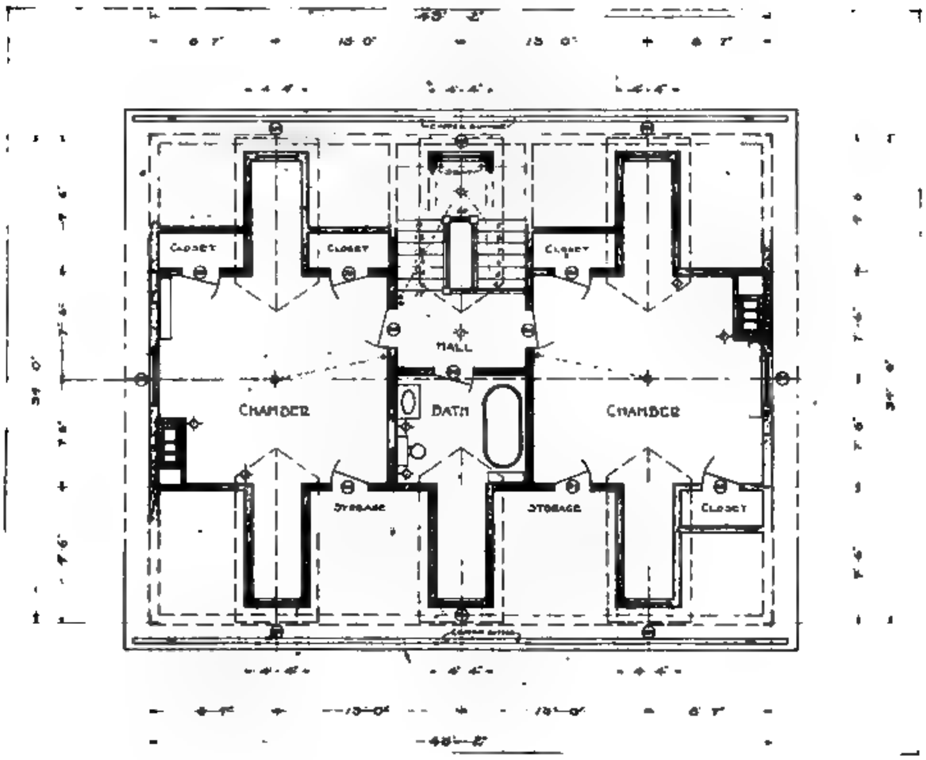


Basement Plan.

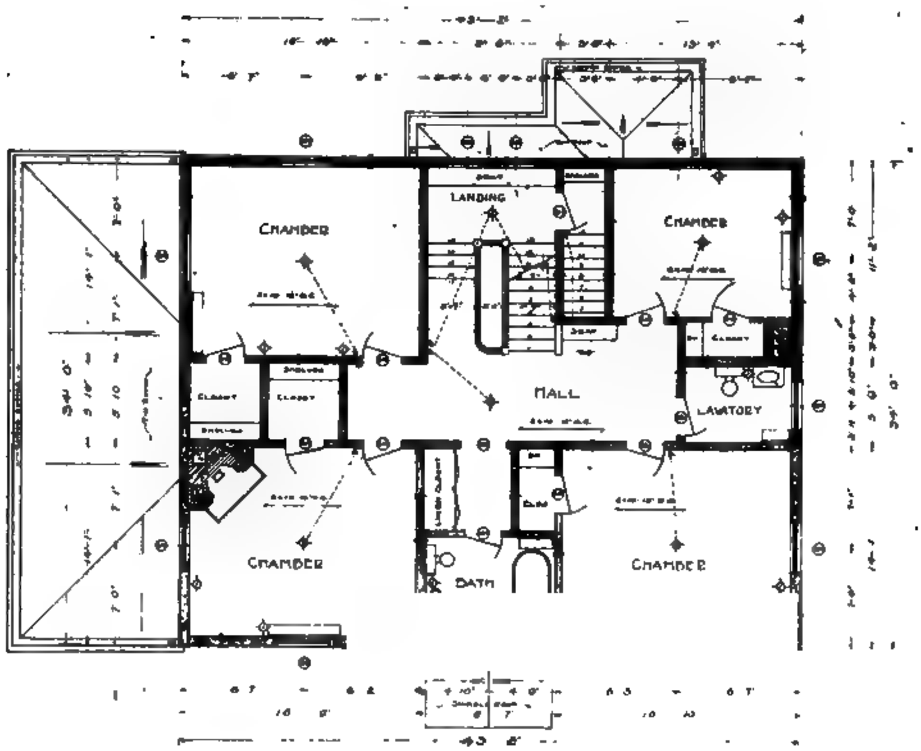
A SMALL COUNTRY HOUSE.

H. W. Keil, Architect.

Students' Working Drawings, Cornell University, College of Architecture.



Third Floor Plan.



Second Floor Plan
A SMALL COUNTRY HOUSE.
H. W. Keil, Architect.
Students' Working Drawings, Cornell University, College of Architecture.

THE LAWYERS' CLUB, NEW YORK

FRANCIS H. KIMBALL, Architect

THE problem presented in creating club rooms for the Lawyers' Club in the space of the upper stories of the United States Realty Building involved the transformation of a long, relatively narrow and unquestionably low-ceilinged area into club rooms which should have continuity in suite and individual dignity of proportion. The area consisted of the three top stories, the twentieth to the twenty-second. The first two stories are used principally as club rooms, while the top story, which was largely built new, is in the peak of the roof and of restricted area, being occupied entirely by the kitchen and service portions.

The plan of the first two stories shows, over all, dimensions of 63 by 265 feet. In the center portion, back of the middle of the long dimension, is the stair hall and battery of six elevators, which form a long, narrow, immovable bulk. The ceiling height was 11 feet on the first story and only 9 feet on the second. Within this unpromising area a complete series of club rooms has been created. The first story contains the principal rooms of the club, the central foyer, office and coat rooms, with an ornamental staircase leading to the floors above and a hall of approach to the main dining room at the east, and the club lounging rooms at the west. On the second story east is the dining room mezzanine, and the grille; in the center the manager's quarters, and the ladies' dining room and retiring rooms; to the west, private dining rooms.

With this disposition of areas in mind, we may consider the solution of the problem which developed itself as a matter of architectural and decorative treatment. Here, proportion is the result of visual effects in color and ornamental form, as structural proportion was an impossibility, except in the dining room. With the sole structural change of cutting away five bays between the center columns, about 20 by 90 feet, the whole east end of the two stories was thrown into one great room, with a ceiling twenty feet in height and with a surrounding mezzanine. Structural proportion was thus gained in this space, which was to form the principal room of the club. It remained to decorate it and to join this room with the rest of the club rooms in uninterrupted sequence. The secret of this lay in the great Gothic window, which is the center of attraction and may be said to be the pivot about which the whole life of the club centers.

This window is a mass of rich color, while all other surfaces, walls, carpets and decorations are in a quiet, harmonizing monochrome. By placing this rich Gothic window at the end of the vista, the eye is taken away from the hall and swept down to the window, thus making a connecting link between these two portions.

The idea embodied in the window is that law is an organism, that it has historical continuity, and is, in fact, a history of civilization; that law is the expression of orderliness. Viewed in this light, no nation, any more than any individual, stands disconnected or by itself. This huge window, 17 by 20 feet, is divided into various horizontal and longitudinal panels. The first or foundation panels on the left hand side represent symbolically the laws of the

THE LAWYERS' CLUB. THE DINING ROOM.

Builders: The Geo. A. Fuller Co.
Dumbwaiters: James H. Roberts Elevator Co.
Decorations and Furnishings: The Tobey Furniture Co.
Lowe Bros.' Co. Sealcote and Mellotone Colors in Oil.
Ornamental Plaster: P. J Durcan, Inc.
Evans' "Crescent" Expansion Bolts Used.
C. O. Mailloux, C. E. Knox, Consulting Electrical Engineers.

Medes, Persians, Egyptians and Greeks. On the right hand side is symbolically shown forth the laws of the Scandinavians, Anglo-Saxons, and Normans On the second horizontal panel there is shown respectively on the left hand side the figures of Justinian and his court codifying the laws of the nations preceding them, and on the right hand side William the Conqueror and his counselors carrying the Roman law through the Norman into England, and embodying into the system of jurisprudence the laws of Anglo-Saxon and Scandinavian nations. The great central shaft, dividing the two dominant flanking panels, symbolically sets forth the evolution of the common law of England, its transition to America, symbolized by the Mayflower, the American seal and a beautiful figure of Justice blindfolded, standing upon a classic building, suggestive of the Capitol at Washington. At the top of the window the ten tables of the law are introduced, as suggesting the dominating moral quality running through all law. While the window is practically square, so cleverly has the composition and perspective been adjusted that one at first sight might think the window was twice as high as it is broad, thus elevating and ennobling the room. The base of the window is three feet above the floor. From this space there emerges a fountain, symbolic of law as a living stream. The plant life around the fountain is emblematic of the organic life and virility of law, adapting itself to new forms of civilization.

While shades of brown and gold are

THE LAWYERS' CLUB. THE DINING ROOM.
From the Perspective By Henry J. Davison.

Silver Service: The Gorham Co.
Marble Fountain: D. H. McLaury Marble Co.

dominant with some decoration in blue throughout the dining room and hall, the main lounge at the east end is an entirely different treatment. Here the Gothic gives place to the Flemish and the colors change to black oak in the woodwork and bluish green in the tapestry. The transition is softened bv a rug which, if the term is applicable, is almost iridescent. It blends from brown to blue and from blue to brown, according to the side of approach. The lounge is cosily furnished, containing a great Caen stone fireplace, surrounded by comfortable chairs. Adjoining it is a writing room in formal French treatment and a smaller room which is in effect a conservatory or enclosed veranda surrounded by a marble wainscot with flowered tapestry above. This contains a broad fireplace and is furnished in Flemish oak. Its outdoor effect is heightened by the gilded Gothic screen carrying leaded glass panes which divides it from the hall.

This lounge is low-ceilinged in proportion to its area, being but eleven feet in height. To overcome this, several devices have been resorted to, such as gradually diminishing the length of the panels in the wainscot, thus heightening this portion as in perspective. The contrast of the black woodwork and the white ceiling also elevates the room and, finally, the means of illumination by reflex lighting increases the apparent height. Lights in standards placed about the floor and concealed behind the cornice of the wainscot cast their rays upon the white ceiling which diffuses an even illumination about the room.

Mr. George T. Mortimer, chairman of the Building Committee, and Mr. Henry

THE LAWYERS' CLUB. HALL AND LOUNGE.

Builders: The Geo. A. Fuller Co.
Francis H. Kimball, Architect.
Decorations and Furnishings: The Tobey Furniture Co.
Caen Stone Mantel: D. H. McLaury Marble Co.
Stone Flower Boxes: The Erkins Studios.
C. O. Mailloux, C. E. Knox, Consulting Electrical Engineers.
Lowe Brothers Co. Sealcote and Mellotone Colors in Oil.
Star Expansion Bolts Used.
Kalameined Doors: The Kalamein Co.
Ornamental Plaster: P. J. Durcan, Inc.
Vacuum Cleaning: Vacuum Cleaner Construction Co.

J. Davison, who had charge of the work, deserve great credit, with Mr. Francis H. Kimball, who was the architect.

The Tobey Furniture Company had the contract for the furniture, draperies, painting and decorations, under the direction of Mr. Stewart F. Douglas, while the George A. Fuller Company did the structural work. J. Gordon Guthrie designed the stained window, which was constructed by The Kimberly Company.

The walls are primed with Sealcote and finished with Mellotone, colors in oil made by the Lowe Brothers' Company. P. J. Durcan, Inc., did the ornamental plastering. The D. H. McLaury Marble Company did the interior marble work, the handsome marble fountain and the genuine Caen stone mantelpiece in the lounge. The stone flower boxes in the hall came from the Erkins Studios. C. O. Mailloux and C. E. Knox were the consulting electrical engineers, and the James H. Roberts Elevator Company put in the automatic dumbwaiters. The silver service of the club was supplied by the Gorham Company.

THE LAWYERS' CLUB. THE EMBLEMATIC WINDOW.

CROISIC BUILDING, 26TH STREET AND 5TH AVENUE, NEW YORK.

Brooklyn Vault Lights Used.
Charles H. Peckworth, Builder
Plumbing, William Young Plumbing Company
Switchboards, etc.: Metropolian Electric Mfg. Co.
Enameled Brick: American Enameled Brick & Tile Co.

Frederick C. Browne, Architect.
Randolph H. Amiroty, Assoc. Architect.

CROISIC BUILDING. DETAIL OF UPPER STORIES.

Charles H. Peckworth, Builder.
A. B. See Elevators.
Grant Overhead Pulleys in Mullion Windows
Interior Marble: D. H. McLaury Marble Co.
Ornamental Plaster: McNulty Bros. Inc.
Terra-Cotta: New York Architectural Terra-Cotta C

Frederick C. Browne, Architect.
Randolph H. Amiroty, Assoc. Architect.

HOTEL SAMUELS, JAMESTOWN, N. Y.

Esenwein & Johnson, Architects.

Otis Elevators.
Revolving Doors. Atchison Revolving Door Co.
Ornamental Iron: The Wells Architectural Iron Co.
Boilers: Harrisburg Star Boiler Co.

HOTEL SAMUELS. LOBBY AND DINING ROOM.

Esenwein & Johnson, Architects.

Furniture: Jamestown Lounge Company.
Plumbing, Heating and Ventilation. Otis & Sons Engineering Co.

(See description on page 32.)

ST. BARNABAS' CHURCH, WOODLAWN, N. Y.

Heating and Ventilating, Geo. E. Rinkenberger Co. **N. Serracino, Architect.**
Stations of The Cross: Daprato Statuary Co.

Statuary: Daprato Statuary Co.

ST. BARNABAS' CHURCH, WOODLAWN, N. Y.

N. Serracino, Architect.

BOOK REVIEWS

WOOD AND FOREST, by William Noyes, M. A. The Manual Arts Press, Peoria, Ill. Cloth. Price, $3, postpaid.

Those of us who have visited the American Museum of Natural History, and are in any way familiar with the Jessup collection of American woods, may bring the enjoyments of this collection into our homes in book form by means of this new book, "Wood and Forest." A typical description covering two pages, shows a habitat map, the leaf, and life-sized illustrations of the radial and tangential sections of the wood, together with, in many cases, a microscopic cross-section. To the botanist the book will be a great pleasure. To the woodworker it will be a source of much valuable information. To the architect it furnishes a source of information as to the grains and finishes of wood which may be employed successfully for beautifying interiors.

The book divides itself naturally into two portions; that dealing with the structure and properties of wood and the principal North American species, and that which deals with the distribution and composition of the North American forests. This portion contains the most beautiful illustrations that it has been the writer's pleasure to view in many days, and throughout it may be said of the work that it may be classed as one of the most excellent examples of half-tone process work, both in the quality of the engravings and in the excellence of the printing.

CONCRETE BRIDGES, CULVERTS AND SEWERS, by A. A. Houghton. The Norman W. Henley Publishing Co., New York. Paper. Price, 50 cents.

This is a treatise illustrating and giving an explanation of various types of solid and reinforced concrete arched, slab and girder concrete bridges. Information is also given concerning the moulding of concrete culverts, drains and sewers. The diagrams are clear and are explained in the text. The book is a useful one for masons and contractors located in suburban and country towns.

HINTS FOR PAINTERS, DECORATORS AND PAPERHANGERS, by C. Godfrey. The Industrial Book Company, New York. Cloth. Price 50 cents.

This little book of practical instruction is intended for the use of the artisan or tradesman. The young painter should derive great benefit and advancement from a careful study of the book, as its hints, rules and recipes are reliable and practical and of the kind for which he has call every day. The arrangement is logical and progressive, treating the decorative work in the order in which it would be done and elaborating on the various methods as the work progresses. Various decorative schemes are presented in the illustrations as suggestions for various portions of a house or building.

CONSTRUCTING CONCRETE PORCHES, by A. A. Houghton. The Norman W. Henley Publishing Co., New York. Paper. Price, 50 cents.

This book gives practical instruction for casting monolithic concrete porches and approaches, and also for building such structures of concrete blocks, or reinforced concrete and with various finishing ornaments. The instruction is such that a home-made product of good construction and appearance is possible.

MODERN HOSPITALS, by Edward F. Stevens, Edward Pearce Casey, Clarence W. Williams, D. D. Kimball, E. H. Bostock and M. E. McCalmont and others. The American Architect, New York, 9x12 inches, fifty pages plus eighty-four plates. Cloth. Price ....$5.00 net.

The text contains several general articles, one dealing with the details and equipment of hospitals taking up the minor features of the equipment and planning. There are two articles on heating and ventilation, two on hospital lighting and several articles on special hospitals wherein particular diseases are treated and in which the plan has been influenced to some extent by the treatment. Such hospitals are those for the treatment of contagious diseases, those for permanent invalids and tubercular patients. The illustrative plates which are printed on one side of the page, on a heavy coated paper, contain a great many photographic illustrations, but are particularly interesting because of the preponderance of the plans. The plans show many buildings which have never before been published and also a number which have been gleaned from the pages of the American Architect.

ELEVATOR SHAFT CONSTRUCTION, by H. Robert Cullmer, assisted by Albert Bauer. Practical Suggestions for the Installation of Elevators in Buildings. New York: The Wm. T. Comstock Co. Price, $3.00.

This book, which is a valuable little treatise for the architect and builder and for all who are interested in this subject, includes a great deal of practical information condensed and arranged in most convenient form. Every phase of the elevator-shaft problem in building construction has been covered and the method of presentation is such that ready

(Continued on page 21.)

Art and Architecture

C. J. HENDERSON.

One of the brainiest and most aggressive front-brick men in New York City represents the Harbison Walker Refractories Company, of Pittsburg. Through his efforts he has established an enviable reputation for his house, and the high-grade product of his company can be seen in nearly all of the prominent buildings erected in the past six years in Greater New York.

NATIONAL ACADEMY OF DESIGN, WINTER EXHIBITION.

The Academy Exhibition will be held, opening December 14, 1912, and closing January 12, 1913. Full particulars of the rules for exhibitors may be obtained by addressing the Academy at the American Fine Arts Society Building, 215 W. 57th Street, New York. Exhibits will be received only on November 25th and 26th. The hours for the reception and delivery of pictures are from 9 a. m. to 5 p. m.

The Pittsburg Chapter of the American Institute of Architects, at a recent meeting in the Fort Pitt Hotel, decided on a plan which should prove of great aid to their employees. The plan is one looking towards an arrangement with local architects to grant draughtsmen in their employ leaves of absence that they might study in the department of architecture in the Carnegie Technical Schools of that city. This is the first chapter in the country to begin such a movement, but it is believed that others will follow. President R. M Trimble presided at the gathering.

Do you know our architect? He is the man who put the bungle into our bungalow.
The Evening Mail

The annual meeting of American Society of Engineer Draftsmen, was held in Teachers' College, Columbia University, on Tuesday, October 1, 1912.

In his opening remarks the president displayed a unique chart showing that the society had quadrupled in the past year.

A highly constructive program was adopted for the coming year, which included the establishment of a mutual benefit section, involving a form of insurance.

The officers elected for 1913 were Professor Charles William Weick, of Columbia University, president; William B. Harsel, 1st vice president; Charles A. Clark (Crocker-Wheeler Co.), 2d vice president; C. B. J. McManus, 3d vice president; L. T. Maenner (Missouri Pacific R. R.), 4th vice president, and E. F. Chandler, Henry L. Sloan and C. W. Fleming to the Board of Governors.

UNITED STATES CIVIL SERVICE EXAMINATION.

The United States Civil Service Commission announces an open competitive examination for mechanical draftsman for men only. From the register of eligibles resulting from this examination certification will be made to fill a vacancy in the position of copyist draftsman, at $900 per annum, in the Engineer Department at Large, Milwaukee, Wis., and vacancies as they may occur requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

This examination will take place on November 11, 1912 Full particulars may be obtained by addressing the Commission at Washington, D. C.

On November 20th and 21st, there will be another examination for heating and ventilating Draughtsmen. Particulars of this may also be obtained from the same source.

At Pratt Institute, Brooklyn, there is now in progress an exhibition of oil and water color paintings by Henry B. Snell. This exhibition is open day and evening until the 26th of October.

SEPTEMBER CORRECTION.

In our September issue on pages 376 and 377 illustrations were given of the Wilson Building. This is a well fireproofed modern structure and its interior finish, Dahlstrom metal doors and trim, made by the Dahlstrom Metallic Door Company, Jamestown, N. Y., were used. Fireproof doors of the kalamein type were installed in certain portions by the Leonard Sheet Metal Works, whose main office and works are at the head of Ferry Street, Hoboken, N. J., and the fireproof windows were installed by S. H. Pomeroy & Co., Inc., 427 West 13th Street, New York City.

Room on First Floor of the U. S. Rubber Building. White "Memphi Fresco Paint" Used Throughout Building.

A CORRECTION.

An error occurred in our descriptive article of the U. S. Rubber Building, published in September issue. On page 373 we said, "Fresco White Paint Used," when we should have printed, "White 'Memphi Fresco Paint' used throughout building."

We regret error and take pleasure in correcting it. Memphi Fresco Paint is manufactured in Memphis by the De Soto Paint Mfg. Co. Neven Sparks Lamb, of 149-151 Church Street, New York City, is the eastern agent.

Book Reviews

(Continued from page 18)

reference is possible to any detail of the subject. As Mr. Reginald P. Bolton says in his introductory note, the book contributes toward the safety of elevator apparatus by affording necessary information as to the proper proportions and spaces surrounding the installation of the car in its hoistway, thus promoting the safety as well as the convenience of the general public. The treatment of the subject is divided into five parts: Elevator shafts, specifications for elevator work, door-opening devices and elevator car gates, elevator signal systems and special appliances, and rules and regulations governing elevator installation in New York City. Each of these subjects is carefully treated and the discussion is enriched and made very clear by 63 plates, showing fully all the details of elevator-shaft construction. As elevator-shaft construction in buildings has never been treated in detail in the technical manner used in this book, the work supplies a real demand for information on this subject. New York practice is followed and the building department laws and regulations of New York have been made the standard. The author has also covered the subject of specification writing for elevator equipment by using two forms: One, a simple specification for a single elevator; the other a more elaborate equipment, embracing several styles of cars suitable for an office building. This book should be in the hands of every architect as well as in the working library of every one at all interested in this important phase of building construction.

OBITUARY.

Mr. William Horace Corbin, Vice President of the Joseph Dixon Crucible Company, died on Wednesday, September 25, 1912.

Fireproofing and Fire-Protection

MR. G. H. STEWART

THE SUBWAY CONSTRUCTION FIRE MENACE.

Fire Commissioner Johnson has issued an order, addressed to each of the contractors for the new Broadway-Lexington Avenue subway, New York, requiring that in every case where vault walls or the walls of buildings adjacent to the subway are pierced, a fireproof wall entirely cutting off the building from the street or adjoining property, shall be constructed.

Plans and specifications for the proposed changes in walls and the proposed fireproof partitions are required to be filed with the Bureau of Fire Prevention for approval prior to the beginning of the work. The approval of the Fire Commissioner will be conditioned upon the conformity of the plans to the specifications required by the Bureau of Fire Prevention, which are substantially those imposed by the New York Fire Insurance Exchange in its recent circulars. No work can be legally carried on by contractors until these requirements have been complied with.

The effect of the order is to compel subway contractors to construct at their own expense the fireproof partitions which property owners have hitherto been required to provide in part at their own cost as an alternative to largely increased insurance rates during the process of subway construction.

This order is the occasion of a controversy between the New York Fire Insurance Exchange and the Public Service Commission nad as if to cloud the issue, they have raised the question of the legality of the Exchange as an institution to pass upon such matters. Mr. Willis O. Robb, in an interview, which appeared in the New York Times, said:

"The Public Service Commission complained to the Mayor of the illegality of the Commissioner's order, and to you of the illegality of the very existence of this Exchange, at whose door it laid the blame really due to its own complete and astonishing failure even to think of the fire hazard involved in connecting up a mile or two of buildings on each side of the congested value section of Broadway by subway and sidewalk vault openings without any kind of fire stop whatever. The fact in this as in many a similar case has been that the underwriters have better safeguarded the public interest involved than has the public body directly charged with that duty.

"So much for the facts of the particular transaction. As to the proposed hearing on the general question of the right of this Exchange to exist—a wholly irrelevant question clearly raised to distract attention from the shortcomings of the complainant body—we are quite content that you should order and hold such a hearing whenever your official duty seems to you to require it. This Exchange operates under the close supervision of the Insurance Department of the State, in accordance with a statute to that effect passed upon the recommendation of a legislative investigating committee that after a full inquiry had unanimously reported it to be for the public interest that such organizations, if proper supervision and publicity are maintained, should not only be allowed, but encouraged."

SMOKING PERMITS.

On the advice of the attorney general the New York State Fire Marshal, Mr. Ahearn, has recently given permits to two large cor-

(Continued on page 26.)

ROCKWOOD SAFETY LOOP SPRINKLER

SHOWING SPRINKLER WITH THE TWO HALVES OF THE STRUT SOLDERED TOGETHER.

SHOWING HOW THE TWO PARTS OF THE SOLDERED STRUT SPRING APART *ONLY AFTER* THE LUMP OF SOLDER IS *MELTED* AWAY FROM THE LOOP.

THE ROCKWOOD SPRINKLER IS UNIQUE IN THAT THE TWO PARTS OF THE SOLDERED LINK ARE HELD TOGETHER, NOT MERELY BY A SWEATED SOLDERED JOINT, BUT BY COVERING THE END OF THE LEVER WITH A SMALL PIECE OF SOLDER WHICH IS MECHANICALLY BOUND TO THE STRUT BY A LOOP OF WIRE RIVETED THROUGH ONE PART OF THE LINK.

THE ROCKWOOD SPRINKLER IS THE ONLY APPROVED HEAD THAT IS INCAPABLE OF OPENING ITSELF BY THE BREAKING OF THE SOLDERED JOINT, WHICH MUST ABSOLUTELY MELT TO OPEN. IT IS THUS IN A CLASS BY ITSELF, SUPERIOR TO ALL OTHERS.

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MANUFACTURERS, ENGINEERS AND CONTRACTORS FOR COMPLETE SPRINKLER EQUIPMENTS USING WET OR DRY SYSTEMS.

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BOSTON - - -	141 MILK STREET	SEATTLE - - -	208 COLUMBIA STREET
BUFFALO - -	300 PRUDENTIAL BUILDING	MONTREAL - -	141 ST. MAURICE STREET

porations to permit smoking in their factories. Both of these companies have provided special smoking rooms for their employes in order to keep them off the streets during the noon hour. Their factories are of fireproof construction.

This permission to allow smoking on the premises, to our minds, increases the fire hazard, according to the nature of the contents of the building. If these are of inflammable nature, the risk is increased through these smoking permits, otherwise the opportunity for a fire is not so great.

In the September Indicator published by the Otis Elevator Company there is an interesting article pertaining to the electrical control of hydraulic elevators. This is illustrated with diagrams, which, together with the text, clearly explain the operation of this device.

AMERICAN FIRE LOSS.

The direct fire loss of the United States during the four years, 1908-11 inclusive, is estimated by the New York Journal of Commerce at $911,000,000. There occurred during this period no conflagration of any considerable extent, the largest being a matter of not more than five or six million dollars. In other words, these were average years without anything to raise the figures above the normal amount, and yet the figures for these four years represent a total annihilation of property of enough value to pay practically the entire national debt of the United States. If we add to these figures the cost of public and private fire protection and fire fighting, the total will be almost double that given.

The net earnings of all railroads in the United States is about $550,000,000 a year. This is not much more than half the net fire loss mentioned and is less than half the total tax levied (and collected) by the fire fiend. The fire loss for one year, if it could be saved, would pay the enormous amount spent by the United States for pensions, and the interest on the United States national debt, and still leave a surplus of almost one dollar per head for every man, woman and child in the United States.

IMPROVEMENTS IN SHINGLE CONSTRUCTION.

To meet the demand for good ornamental roofing, which will provide an excellent, serviceable roof covering, for residences, bungalows, churches, schools garages, etc., The Berger Manufacturing Company, of Canton, has

(Continued on page 28.)

recently placed upon the market two new and distinctive designs of metal shingles.

These new design metal shingles, the "Chieftain" and "Swanee" are both durable and economical. The "Swanee" is a plain design and the "Chieftain" is a bold clay tile pattern and when painted gives a clay tile effect.

The constructions are simple, permitting ease of laying, yet eliminating all possibilities of leaks.

The three-point contact side lock cannot possibly become unhooked after the shingles are nailed in position.

Expansion and contraction are fully provided for. The nails, two to each shingle, are covered by the next shingle placed in position.

A very important feature is the fact that heavy ribs are formed at the top of each shingle to prevent rain or snow from entering.

The materials in which these can be furnished are Galvanized Toncan Metal, Galvanized Open Hearth Steel or Terne Plate of any standard weight.

THE GRINNELL AUTOMATIC SPRINKLER BULLETIN.

In this quarterly, published by the General Fire Extinguisher Co., are listed all fires reported as having occurred under Grinnell Automatic Sprinklers. The October number shows a total of 15,654 fires, of which fairly complete details were obtained in 12,493 cases. It is of interest to note that of this number 7,769 fires were put out by the sprinkler so promptly and with such slight damage to property that no claim whatever for damages was made upon the insurance companies. This represents more than 62 per cent. of the total number of fires of which particulars were known. This means that five fires out of eight are "No claim" fires.

A THEATRE BUILT FOR A FIRE TEST.

A unique test to ascertain the fireproofness of theatres is about to be made under the joint auspices of the German "Steel Trust" and the National Association of Master Carpenters.

They intend to construct a model theatre in Berlin as big as a good-sized residence out of steel, iron, cement, and wood, with iron safety curtains, emergency exits, and a special set of ventilation slats built with a view to diverting the flames in certain directions in case of fire.

The building will, shortly after its completion, be ignited, and the progress of the fire in its various stages will be observed by a commission of experts representing builders, fire departments, architects, and insurance companies.

(Continued on page 30.)

Every conceivable sort of theatre fire emergency will be provided for, and the experts hope to arrive at hitherto unimagined methods of preventing a playhouse holocaust

Particular stress will be laid on the effect on fires of different temperatures within the theatre in both the auditorium section and on the stage. —New York Times.

THE FIRE EXPOSITION POSTPONED.

In a prominent place in this column last month appeared a notice concerning the New York Fire Exposition, and in another portion of the paper appeared an announcement telling of the exposition and giving its date as October 2d to 12th This exposition has been postponed to some date in December, when we sincerely hope it may be successfully pulled off

A fire exposition and conference held in Madison Square Garden would be a good thing. It should have support. No one doubts for a moment why the exposition was postponed To be successful such an enterprise needs the backing of the business firms who would derive benefit from its efforts. It is expensive to hire Madison Square Garden, and surely the promoters of the exposition must receive a return for their large preparatory outlay of time and money. We hear a great deal nowadays of fire prevention. It is quite the usual thing in the newspapers and the public is getting interested. The National Fire Protection Association and others hold conventions where the engineers get together with much scientific discussion. This is as it should be, but it does not interest the small boy or the layman, and yet these could and should be interested. A good exhibition in Madison Square Garden which was well supported by the manufacturers of fire-preventive devices and fireproofing materials would be of great educational value, and no manufacturer need doubt for a minute that the money would come back.

Industrial Progress

THE HOTEL SAMUELS, JAMESTOWN, N. Y.

This eight-story building was built to replace the old Hotel Sherman, which was burned a year or two ago. It occupies a corner lot, and the exterior is of brick and limestone. It has a structurally fireproof frame and floor system. The trim throughout is of wood. The hotel takes its place among the well-appointed hostelries of our smaller cities and ranks well. It is as safely constructed and gives as good accommodation to its guests as any other modern structure in its class.

The architects of the building were Esenwein and Johnson. The builder was William Henley. The plumbing, heating and ventilating of the hotel was done by Otis & Sons Engineering Company. The boilers were put in by the Harrisburg Star Boiler Company. The ornamental iron work was done by the Wells Architectural Iron Company. The building is equipped with Otis Elevators, and Atchison curved wing doors, made by the Atchison Revolving Door Company, are used.

The lobby which is shown in our illustration on Page 426, is furnished with Spanish leather covered furniture in a rich brown tone. This leather is top-grain and tan-shrunk and of special quality. The chairs and rockers for the 250 rooms of the hotel have solid mahogany frames and are upholstered in a soft, rich green fabric. All of this furniture was supplied by the Jamestown Lounge Company

THE FURNITURE.

For hotel lobbies, there is nothing handsomer or more serviceable than fine, leather-upholstered furniture. The leather, which was used for upholstering the lobby furniture of the Hotel Samuels, in Jamestown, N. Y., is of special quality of Spanish leather and is not on the market, as it is made especially for the Jamestown Lounge Company. It is tan-shrunk, top-grain leather and it will outwear any other brand or quality of leather produced for furniture work.

The Jamestown Lounge Company, of Jamestown, N. Y., have also supplied furnishings for the Hotel Utah, Salt Lake City, Utah; Portland Hotel, Portland, Ore.; Statler Hotel, Buffalo, N. Y.; Hotel Taft, New Haven, Conn.; Hotel Vail, Pueblo, Colo.; Georgian Court Hotel, Atlanta, Ga.

IRON ORE.

It is reported by the Bureau of Statistics of the Department of Commerce and Labor that the iron ore shipments from Lake Superior and Lake Michigan ports during June, 1912, amounted to 7,274,732 long tons, an increase of 58 per cent. when compared with the shipments in June, 1911. Iron ore shipments since the beginning of the year, 13,394,964 long tons, were about 54½ per cent. greater than during the corresponding period of 1911. Increases in shipments were reported at all the

(Continued on page 34.)

important iron ore shipping points, namely. Duluth-Superior, Two Harbors, Escanaba, Ashland and Marquette.

The receipts of iron ore show a corresponding increase from 4,460,764 long tons in June, 1911, to 7,219,093 long tons in June, 1912, or nearly 62 per cent. The receipts since the beginning of the year show an increase from 7,959,822 long tons in 1911 to 12,343,667 long tons, or 55 per cent. Over 80 per cent. of the iron ore receipts are credited to Lake Erie ports, the remainder having gone to Lake Michigan ports.

WOODWORK AND DECORATION CONTRACTS.

This has been an unusually good season among the decorators, to which may be added the fact that many of the biggest contracts have yet to be awarded.

Messrs. Charles Grimmer & Son have been fortunate in securing some very important awards. Among them may be mentioned the contract for cabinet woodwork, painting and decoration of the new 22d Regiment Armory, Messrs. Walker & Morris, Architects; the woodwork and decorations in the residence of the Hon. Robert Bacon, at Westbury, L. I., Mr. John Russell Pope, Architect; the cabinet woodwork and decorations in the residence of Dr. F. G. Goodridge, 78th St., New York, Messrs. Foster, Gade and Graham, Architects; also the woodwork and decorations of rooms for companies "L" and "M," Seventh Regiment Armory, F. L. Robinson, Architect.

Mr. Otto G Simonson announces the removal of his offices to the third floor of the Maryland Casualty Tower, Baltimore, Md. Mr. Simonson has associated with him in the practice of architecture, Mr. Louis W. Simonson, Mr. Lucius R. White, Jr., and Mr. William F Stone, Jr.

The Sanitary Dust Removing Company, of Boston, Mass., installed the twelve-sweeper vacuum cleaner plant in the Hotel Copley-Plaza, Boston. This firm is a branch of the Vacuum Cleaner Construction Company, of New York City.

Architects and Builders should investigate **EVANS "CRESCENT" EXPANSION BOLTS**

WITH DOUBLE END GRIP EXPANSION

Constructed on NEW lines. Grip at BOTH ENDS, and on ALL sides. Cannot work loose.

Send for Catalogue and samples screwed into blocks of wood or stone.

Agencies in all large cities **F. H. EVANS** (Patentee and Sole Manufacturer) **31-33-35 Hewes St., Brooklyn, N. Y.**

No. 1, Steel Joist Hanger for Wood Header

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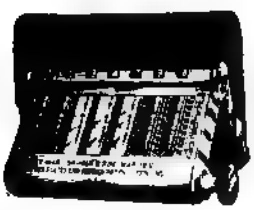

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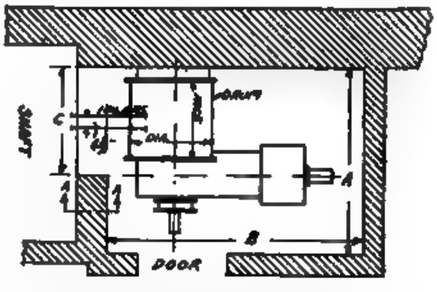

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ARCHITECTURE AND BUILDING

A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. NOVEMBER, 1912 *NUMBER 11*

JOHN WELLBORN ROOT

By THEODORE STARRETT

IN the recent discussion of the achievements of the late Daniel Hudson Burnham, it was inevitable that his deceased partner, John Wellborn Root, should be mentioned by all who really knew the philosophy of Burnham's career. When I wrote for ARCHITECTURE AND BUILDING the account of my recollection of Burnham and of the bust of Root which stood in his office overlooking him as he worked, I got to thinking about Root. It seemed to me almost a duty to say more about him, to raise a voice in these "practical" times in behalf of the memory of a man who did some thing that was bigger and more important than framing the U. S. Steel Corporation or leaving a fortune of a quarter of a billion of dollars.

John Root was a real architect, a draftsman and a designer. Not all architects are real architects in the sense here meant, for some of our "greatest" are merely job getters, interested in the game as a business, but hopelessly inefficient with respect to it as an art.

The thing that made Daniel Burnham great, if fate intends that he shall be immortal, was the World's Columbian Exposition, and if Burnham is to be immortal John Root should stand beside him— in a sense he should stand before him, because in the elements that made the Fair great, the architecture, as opposed to the construction, there is little doubt that Root's was the originating or conceiving mind. Burnham's was the executant mind.

Born in Georgia in 1850, the son of a man of New England descent, John Wellborn Root passed his boyhood in the South. It appears that Root's father had been disappointed in his own youthful hopes of becoming an architect and had decided that his son should have the opportunities which he himself lacked. It was a case of "marking." From his infancy the boy showed wonderful talents in all directions; he learned to sing before he learned to talk; he had a toy violin when he was two years old; he started drawing as soon as he could take hold of a pencil, and at seven years of age we hear of his having his three-year-old sister pose while he sketched her portrait. A piano was purchased by the family when he was twelve years old, and "although the instrument was new to him, he sat down," so it is said, "and played several airs with apparently no effort."

His home was in Atlanta at the time of Sherman's march to the sea, and at fourteen years of age he witnessed the entrance into the city of "Old Tecumseh." After the war he lived in New York City, where he entered the New York University in 1866 in the sophomore class at sixteen years of age, and graduated in 1869. His father's failing fortunes made it necessary for him to go to work.

Work for Root began in the office of Mr. Renwick, the noted New York architect, where Root was a student for one year without salary. After the year with Mr. Renwick came the experience of "looking for a job," as his brother, Walter Root, said he expressed it, as a draftsman, which he finally found in Mr. Snooks' office.

In 1871 occurred the Chicago fire and thither he repaired to become foreman of the office of Messrs. Carter, Drake & Wight, architects. A few days after his entrance upon this engagement Root met Daniel Hudson Burnham, who then joined the force of draftsmen in the employ of the firm. The two young men, Root twenty-one and Burnham twenty-five, became fast friends and continued so until death parted them.

The World's Columbian Exposition at Chicago was a case of "the Wild and Woolly West" taking unto itself—absorbing, as it were—the elegance and culture of the most refined section of the East. Chicago had won the Fair which was to celebrate the 400th anniversary of Columbus's discovery of America. Chicago decided to build a Fair three times as big as the greatest fair that had been theretofore held.

Now, these Chicago business men who had won this prize, the honor of speaking for the United States, as it were, to the whole world, appointed John W. Root consulting architect. Afterwards, at Root's request, the appointment was amended to include Burnham, and it was these two men, Root and Burnham, who persuaded the Directors to employ Eastern architects for the greatest buildings of the Exposition. These Eastern men, in consultation with Root, fixed the style of the composition, and the Western architects who were later appointed for additional buildings vied with them, as far as it lay in their power, in keeping up with the procession.

Who that saw the World's Fair in Chicago can ever forget it? The combination of grey-white buildings, just enough green grass and trees, flanked by wide plazas and the inland waterways or lagoons spanned by low balustraded bridges, with the tideless lake just outside for background and foreground, gondolas and electric launches swiftly and noiselessly plying the waters, flags and streamers flying—Oh, such a lot of them—happy crowds chattering, foreigners dressed in strange costumes, some in outlandish bright colors—the whole makes a picture that has never been equalled. And the man who had taken the lead in designing it, who had drawn with his own hands the plan which was followed with only the slightest changes, who, himself an artist, had selected the artists to share—nay, to appropriate—the honors, died just as he had completed the organization of men who were to do it.

I remember the first time I ever laid eyes on Root, just as I remember the first sight of Burnham. Root was away when I went to work for the firm and it was not until I had been there for a week that I saw him one day pop into the drafting room and, stepping to the large detail table where a roll of manilla paper was hung, tear off a piece, probably a yard and a half long, then pop back without a word, without a look at anybody. A blonde-haired man of medium height, undeniably stout—he was a good liver. His hair was banged and fell in a short fringe around his handsome forehead; his face was florid. Afterwards I saw him. He was at the time thirty-five years old. Yes, he was stout. A splendid head, splendidly balanced; eyes large and blue and flashing. A small nose with quivering nostrils; a sparse, drooping mustache, matching his fine, thin hair; a proud erect carriage with very full chest. He would make the round of the drafting room every

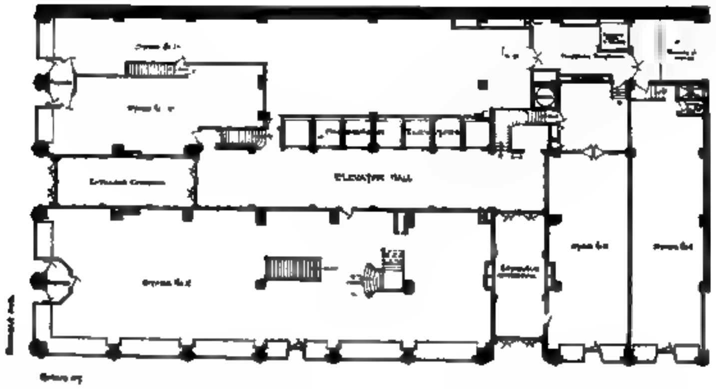
morning, looking at each man's work. He paid no particular attention to me, or to anybody as far as I knew; he simply looked at the drawing, made a few suggestions, perhaps pushing you off your stool and sticking one leg over it. Any comment would be in the shape of a dry little exclamation, a half joke. Once I had drawn in the detail in the gable of a dormer window. He looked at it with a little smile, half amused, half ironical. "This was evidently taken from original sources,"—not another word. I wondered if he was going to rub it out for me. No; he let it go. Ah! John Root, I have come to know that you worked from original sources, too. Then he would pass on to the next man.

His facility with the pencil was remarkable. His hands were peculiar looking in that his nails were rudimentary and he held the short pencil so close to the lead that that he seemed to be drawing with the points of his fingers. He never used an instrument in any of his work of criticising, but would do it all free-hand. He had a habit, which I think was a fault that he would have grown out of if he had lived longer, of depending on his first inspiration—anything once drawn, that was the end of it; it would be detailed just as he drew it.

Stanford White said of a little band of artists who worked together in the East —himself, Charles F. McKim and Augustus St. Gaudens—that they were "redheads." Burnham and Root were redheads, for Root's hair was a reddish-blonde. Both blue-eyed, both auburn of complexion, they were a pair of supermen if ever there were such things. Burnham got the jobs, Root did them. The way they worked, one was as necessary as the other. They were well mated. Root was a natural architect in the fullest sense of the word. He understood construction and took as much interest in designing a foundation as he did in designing any other part of a building. He understood amazingly the philosophy of construction; he had the constructive faculty. His face was turned to the truth; he had no truck with the fanciful decoration of the outside of a building to look like something that it is not. He was a utilitarian in the sense that he used the materials at hand—bricks and terra-cotta—and delighted to fashion his ideas with them. What his tendencies were are shown by the Monadnock Building and the Rand-McNally Building; one built of brown pressed brick from the sidewalk to the roof,—not a thing but brick as far as the mason work was concerned, excepting some granite trim to the entrances; the other built of brown terra-cotta from the sidewalk to the roof.

What Root would have done—what Burnham & Root would have done—if he had lived is perhaps an idle question. His tendencies were along the same lines as Louis Sullivan's. And Sullivan's work in its best tendency is the same as the German tendency of this day, a scientific tendency. And France, with her Style Nouveau is coming around to Sullivanism now. Imagine Root alive today in his ripe prime. Perhaps his ideas would be sweeping Eastward just as he encouraged Eastern ideas to sweep Westward in the World's Fair of 1893.

NOTE: In the story about D. H. Burnham I said, incorrectly, that he and Root came from W. L. B. Jenney's office. Burnham had worked for Mr. Jenney and had left his employ. Later he was employed by Carter, Drake & Wight, as here stated. I am indebted for these and other facts to a Life of John Wellborn Root by Miss Harriet Monroe.



THE MONROE BUILDING, CHICAGO, ILL.

Builder: Geo. A. Fuller Co. **Holabird & Roche, Architects.**
Painting: W. P. Nelson Company.
Generators. Sprague Electric Works.
Waterproofed with "Ceresit."

THE MONROE BUILDING. THE CORRIDOR COMPLETELY FINISHED IN TILING AND FAIENCE FLOOR WALLS AND CEILING

Tile and Faience: Wm. H. Jackson Company. Holabird & Roche, Architects.

BURNING A "FIREPROOF" BUILDING

THE opportunity to moralize is unprecedented, and yet, is it worth while? The reader is usually quite as well fitted constitutionally to moralize as the writer, and as a rule much prefers his own efforts in that direction.

On February 28, 1912, at Rockford, Ill., a fire occurred in the office building of the Emerson-Brantingham Company, which is an isolated building standing in a group of manufacturing buildings that comprise their works. The destruction wrought by this fire was of a most surprising nature, and the before-and-after pictures are as striking as some advertisements for a hair tonic. However, with due apologies to the manufacturers of hair invigorators the illustrations presented on the following pages are real pictures, and we are indebted to the Quarterly of the National Fire Protection Association for the use of their cuts and for the description of the building and the results of the fire.

The building is a detached three-story structure, 210 by 62 feet, with undivided floor areas. The construction is of reinforced concrete columns, beams and girders, with a tile and concrete floor system and roof. The floor surfaces are of cement and tile mosaic. The stairs are of iron and marble near the center of the building and not enclosed. The window frames, interior trim and office partitions, which, as shown by the illustrations, are about 8 feet high, were largely of oak. The relatively small amount of combustible material is clearly shown in the illustrations made previous to the fire.

To quote from the "Quarterly," the building "had no internal protection, being dependent on the standard fire equipment of the works, consisting of hydrants fed by two 1,000-gallon Underwriter pumps and a large tank on 100-foot trestle." No mention is made of the presence or use of fire pails or chemical extinguishers or standpipes within the building, so it is assumed that the only means of fighting the fire was by lines of hose run in from the outside hydrant connections.

The first floor of the building was used as a show room for agricultural implements; the second for general offices; and the third as a dining-room and supply room.

The fire started about 10.30 P. M. in the east end of the second floor, being probably caused by the carelessness of some smoker among the office force who worked late. It was first discovered bursting from the windows in the east end and by the time the fire streams were applied, it extended over half the floor. A "hot air" explosion drove the fire-fighting force from the room and spread the fire through the entire floor, up the marble stairs to the third floor and through the windows at the east end of the third floor. The fire burned itself out from lack of more combustible material.

Practically everything on the second floor was destroyed, including many valuable office records. The first and third floors were seriously damaged by smoke and water. The effect on the structure of the building was to cause the spalling off of concrete from twelve columns, in several laying bare the rein-

EMERSON-BRANTINGHAM CO. BUILDING.

The second story hallway before and after the fire, showing how the burning of a minimum of wood in trim and furniture may wreck a structurally fireproofed building

forcement and also baring the reinforcement of three concrete ceiling girders. The lower webs of numbers of the terra-cotta tiles in the ceiling bays were also cracked out. The upper part of the east brick wall was also cracked, due to the expansion of the floor, and required rebuilding. The floors were also considerably cracked on the third floor east. The north and south walls were also pushed slightly out of line. The loss was figured at $75,000.

We quote from the report in the Quarterly of the National Fire Prevention Association.

"It is somewhat surprising that the amount of heat developed by the burning of the office furniture, papers, etc., should have caused such excessive havoc with the material used in the construction of the building."

However, loading tests made after the fire indicate that the strength of the building was not seriously impaired, and that its structural shell could be stored and the interior refinished.

This fire is the strongest conceiv argument for the use of non-combus window frames and sash and inte trim. We may go even further and of metal furniture and interior partiti The "hot-air" explosion in an ins spread the fire over double the a This building was built with a cen hallway and was practically divided two wings by low partitions. If it been separated into two rooms by walls at either side of this central l way, the fire would undoubtedly h been confined to one end where it o nated, and the damage materially l ened.

What occurred in this building, w was undoubtedly considered by the o ers and we think would have been c sidered by most architects a well proofed structure, is just as apt to cur in a very large percentage of

EMERSON-BRANTINGHAM CO. BUILDING.
The northwest section of the second floor showing spalled concrete columns, barin reinforcement and webs of terra-cotta floor tile cracked off.

modern office buildings. There are buildings now erected which we believe impregnable to such danger, both because of their structural materials and their fire-preventive systems. But these stand out in the limelight among their many unprotected neighbors. The modern office building with wooden trim in the majority of our cities, is even more open to destruction by fire than the example here shown, and the greater the number of stories the greater the danger.

FIFTH AVENUE ENTRANCE TO STORE OF BLACK, STARR AND FROST.
Carrère & Hastings, Architects.

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BANK VAULTS IN THE SECOND NATIONAI BANK, BOSTON, MASS.

The Vault Door Open.

THE design of a bank vault presents new and numerous problems to the engineer that are never realized by the public at large.

The construction must be such as to furnish protection against burglarious attack, including the use of the oxy-acetylene burner, an instrument now extensively in use throughout the world. Fireproof protection must be absolute, and in this connection the structure must be so strong as to withstand great shock from falling masses occasioned by a collapse of the building in which it is located. To provide such a structure to guard against these dangers, was the problem that confronted the vault engineer, Frederick S. Holmes, when called upon to design the vaults for the Second National Bank, Boston.

The security vault is placed at the rear of the main banking room and is 26 feet 8 inches long by 10 feet wide by 9 feet high, inside, and the walls, top and bottom, are approximately 21 inches thick. The inner portion of the walls consist of a drill and shock proof steel li outside of which is rock concrete em ding a steel rail grillage. The vau divided into two compartments, witl entrance to each. Both entrances protected by doors of composite struction, 2 feet thick; each weig twenty tons. The construction of door affords protection, not only ag attack by drilling and explosives, also against attack by the oxy-acety burner.

The locking mechanism of the d is arranged in a novel manner by pla the combination locks upon the ja or door frames, and the time locks the doors proper; each individ checking the bolt-throwing mecha and necessitating a hole through the and another through the jamb before mechanism can be tripped.

In addition to the security vault, t

The Vault Closed.
Bank Vault Engineer: Frederick S. Hol

THE ENTRANCE WITH BRONZE DOORS.—THE SECOND NATIONAL BANK.
Bronze Doors: The Gorham Co.

is a fireproof vault in the basement for the storage of books and records, and a similar vault on the mezzanine floor, in which the active books and records of the institution are kept at night.

The vaults were built and installed by Remington & Sherman Company, under the supervision of the engineer.

The interior of this new banking room possesses the architectural interest of a good design. It occupies a portion of the Minot Building and the whole was designed by Parker, Thomas and Rice. Thomas Bruce Boyd designed the interior equipment and furniture for the bank, and the Doten-Dunton Desk Co. supplied the larger part of the furniture, including the wooden fixtures in the cages. The bronze entrance doors and the interior bronze work is the production of The Gorham Co., who also designed the doors of the adjoining Minot Building of which Parker, Thomas and Rice were the architects.

Furniture: Doten-Dunton Desk Co.

THE SECOND NATIONAL BANK. PRESIDENT'S OFFICE AND BOARD ROOM
Parker, Thomas and Rice, Architects
Interior Equipment and Furniture designed by Thomas Bruce Boyd.

BUILDING AT 556 FIFTH AVENUE FOR M. KNOEDLER & CO.

Cut Stone Contractors: B. A. & G. M. Williams. Carrère & Hastings, Architects.
Otis Elevators.
Steel Shutters: Jas. G. Wilson Mfg. Co.

DETAIL OF BUILDING FOR M. KNOEDLER & CO.
Cut Stone Contractors: B. A. & G. M. Williams. Carrère & Hastings, Architects.

INTERIOR OF BANKING ROOM FOR S. JARMULOWSKY.
Interior Contractors: Bankers Building Bureau. Rouse & Goldstone, Architects.
Interior Marble: Voska, Foelsch & Sidlo, Inc.
Bronze Work: Penn Brass & Bronze Works.
Interior Woodwork: Kertscher & Co.

S. JARMULOWSKY'S BANK BUILDING, 54 CANAL STREET, NEW YORK.

Interior Contractors: Bankers Building Bureau.
Painting and Decorating: Robert Arnstein.
"Star" Ball Bearing Door Hangers.
Ornamental Iron: A. Perlman Iron Works, Inc.

Rouse & Goldstone, Architects.

THE QUEENS PLAZA COURT BUILDING

THOMPSON & FROHLING, Architects

THE growth of Long Island City consequent to the connection with Manhattan by means of the Queensboro Bridge has been largely to date a development of factories and residence sites. The population has now increased to such an extent that a large business building is warranted, and the Queens Plaza Court has been erected to meet this demand. It is situated at the north side of the bridge plaza, where transit facilities are of the best, and it occupies a full block front.

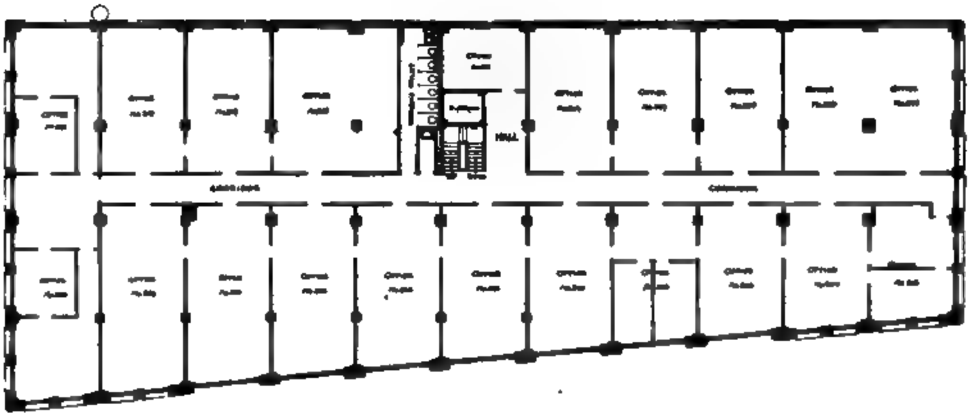
The building is of the usual steel frame construction, now erected to a height of four stories, with the prospect of adding eight more at a future time. The finish of its hallways and interiors places it among the best class of office buildings, which would be suitable to many Manhattan locations.

The Tubes Realty and Terminal Company were the builders. The exterior is largely of terra-cotta supplied by the New York Architectural Terra Cotta Company. The lower stories are of limestone. The ornamental ironwork was done by A. Perlman Iron Works, Inc.; the plastering by Joseph Kneer; the painting by Peter McKay, Inc.; and the electric wiring by the Boyd Equipment Company. The elevator equipment will eventually consist of three cars, but at present one only is installed, an A. B.

THE LONG ISLAND CITY SAVINGS BANK IN QUEENS PLAZA COURT BUILDING
Bronze Screens: John Polachek Bronze & Iron Co.

See machine. "Star" ball bearing door hangers are used.

The Long Island City Savings Bank occupies one corner of the building, and has a plain but well appointed banking room. The bronze screen for this room was supplied by John Polachek Bronze and Iron Company.



QUEENS PLAZA COURT, LONG ISLAND CITY, BORO. OF QUEENS, NEW YORK CITY.

Builders: Tubes Realty & Terminal Co. Thompson & Frohling, Architects.
Architectural Terra-Cotta: New York Architectural Terra Cotta Co.
Ornamental Iron: A. Perlman Iron Works Inc.
Metropolitan Detachable Mechanism Flush Switches.
Evans' "Crescent" Expansion Bolts Used.
Bronze Letters: Penn Brass and Bronze Works.

CENTRAL COMMERCIAL AND MANUAL TRA ING HIGH SCHOOL, NEWARK, N. J.

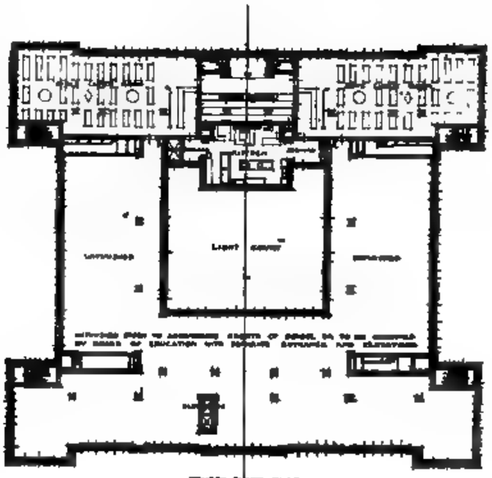
ERNEST F. GUILBERT, Architect

THE site of this school building is on a lot sloping from High Street to Summit Street in Newark, N. J. The architectural design is English Gothic expressed in brick and terra-cotta. A terrace precedes the main façade on High Street, being approached by flights of steps from the sidewalk level, with a court before.

The plans are well developed and exceedingly interesting. Consideration of the basement plan shows that the area below the terrace is fully utilized. The entrance at the court level leads to two elevator shafts in which at some future time cars may be installed to give direct communication with the top floor of the building, which it is anticipated may be ultimately used to accommodate the Board of Education. The gymnasium and power plant occupy the area below the terrace.

From the first story, the elem
scheme of the plan is at once evide
consists roughly of a hollow square
corner towers, in each of which is lo
a stair well: two corridors runnin
full length of the building parallel
the terrace, and two cross-conne
corridors surround the central pc
occupied in the first and second st
by the assembly room, and above
by the light court. The long corr
connect the stair wells. There is
complete circulation about the v
floor, class rooms, laboratories and
rooms all facing outwardly and
one opening directly onto the corri
The stairs are of iron with stone tr
and the flights are entirely enclosed.
two stairways in the north side o
building are inter-crossing, twin fli
with separate entrances. All stair
are separated from the corridors by

THE EAST ELEVATION OF THE SCHOOL.



FOURTH FLOOR PLAN

FIRST FLOOR PLAN

BASEMENT PLAN

PLANS OF THE CENTRAL COMM

Otis Elevators.
Dumbwaiters: The Storm Mfg. Co.

Ernest F. Guilbert, Architect.

THE AUDITORIUM.
Evans' "Crescent" Expansion Bolts Used.
Stanley's Ball Bearing Hinges.

and wire glass partitions, with kalameined doors. For convenience in the school, certain of the stairs are used only for going up and others for coming down, thus dividing the traffic. The location of the toilet rooms and the general features of the plan can be readily observed.

An Enclosed Stair.

The school has accommodation for 1,200 pupils and the auditorium a seating capacity for 1,000.

There is at the present time one Otis elevator for service of the school, this being used for both passengers and freight.

In construction the school is built upon rock and is of steel frame, fireproofed with terra-cotta and concrete. The floor system between the bays is constructed on the two-way, corr-tile method. The bays are of large extent, and the steel supporting members consist of deep I-beams which are fireproofed with concrete. To give a detailed idea, we will describe a typical bay with dimensions of 30x33 feet between column centers. This is supported on the wall end by an 18-inch, 48½-pound Bethlehem I-beam, and by 24-inch, 120-pound beams on the two long sides and a 24-inch 73-pound beam at the inner side. The tiles which were placed upon false work for construction,

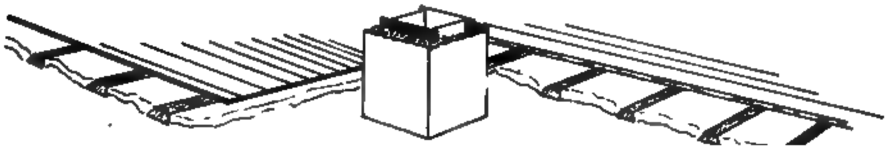
consist of flanged blocks spaced both ways 15 inches on centers. The blocks are of 12x12 inch top dimensions and 7 inches in height. To close the open end of the block, channel sections were used, giving equal spacing to that provided by the flanges on the closed sides of the blocks. Small square tiles were used to close the openings at the corners. When the blocks were spaced, two way channels were produced, having a uniform width of 3 inches between the sides of the channels. The reinforcement used was one ⅞-inch deformed bar in each rib. This construction gives an entire tile ceiling for the panel. The concrete is poured into an entire tile form, and is surrounded by tile at all points below. It is filled in to a height of 3 inches above the top of the tile, making a complete floor slab 10 inches in thickness. This floor slab was figured to have a dead load of 85 pounds per square foot and to carry a live load of 75 pounds per square foot. The appearance of the upper side of the floor while being laid, and the under side at completion, may be seen by the photographs, while the drawing presented on page 455 gives a clear idea of the system.

An interesting test was made of this floor panel, which is shown by a photograph at the time of the test and by the plan and section. The panel was loaded with brick piled so as to avoid arching action, to a total weight of 150,050 pounds, which figured to 152 pounds to the square foot. Deflection readings were taken under loads of 50, 100 and 150 pounds. The net deflection at the centre of the panel was 7/32 inch under the heaviest load. No permanent settling could be detected upon removal of the load. This tile-concrete floor system is known as the "Corr-Tile" or Burchartz system.

The structural partitions in the school are of terra-cotta. The interior trim

THE ENGINE ROOM.
Amply spaced machinery, with an adjoining demonstration room.

THE MACHINE SHOP INSTRUCTION ROOM
Dumbwaiters: The Storm Mfg. Co.
Chicago Spring Butts Used



THE METHOD OF CORR-TILE CONSTRUCTION.

and doors of all class rooms are of wood and glass. The fire preventive system consists of four stand-pipes in the corridors near the stair wells which are supplied directly from the city pressure. For the fire alarm system there are two push buttons on each floor with electric bells distributed throughout the building. The signals may be operated from the push buttons or from the Principal's office. Outside alarm is given from the Principal's office.

The ventilating system for the school is arranged in four vertical stacks coming up approximately at the intersections of the corridors. These stacks contain both exhaust and supply pipes. The distribution of air to and from all classrooms is provided for by a chamber above the corridors, the chamber being divided into two levels, the lower one for supply and the upper one for exhaust. The supply enters the top of the room and the exhaust is drawn from the bottom. This arrangement provides for the ventilating flues without wasting

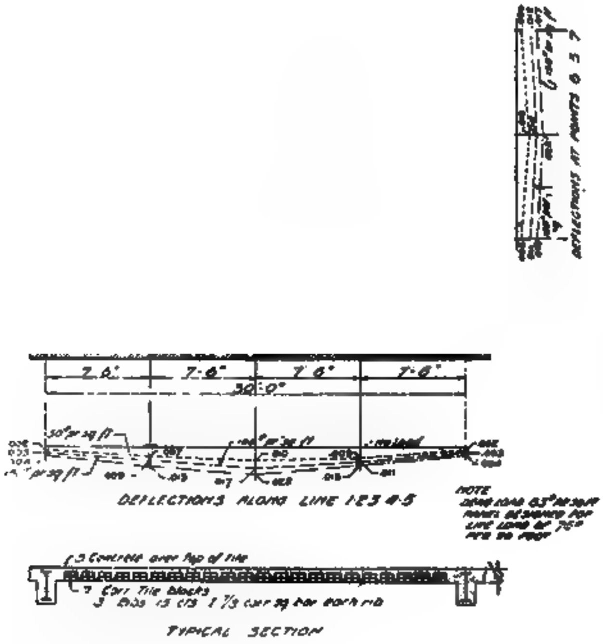
CORR-TILE FLOOR BLOCKS AND REINFORCING BARS READY FOR CONCRETING.

A Load Test on One of the High School Floors.

valuable space, as the diminution of head room in the corridors is unobjectionable and the most direct access to the class rooms is provided. The two supply fans are of 12-foot diameter, with 5-foot faces. There are four exhaust fans, one for each shaft.

There are four Babcock and Wilcox 150 H.P. boilers for heat and power. All power is generated by three 100 kilowatt direct connected, three wire generators. These furnish light and power for all machinery in the building, there being 34 electric motors in use for ventilating and power in the class rooms.

The Storm Mfg. Co. furnished the dumb-waiters and the elevator now installed is an Otis electric machine.



Plan and Section of the Tested Panel Showing Deflection Under Load.

GRAND STAND FOR THE POLO GROUNDS

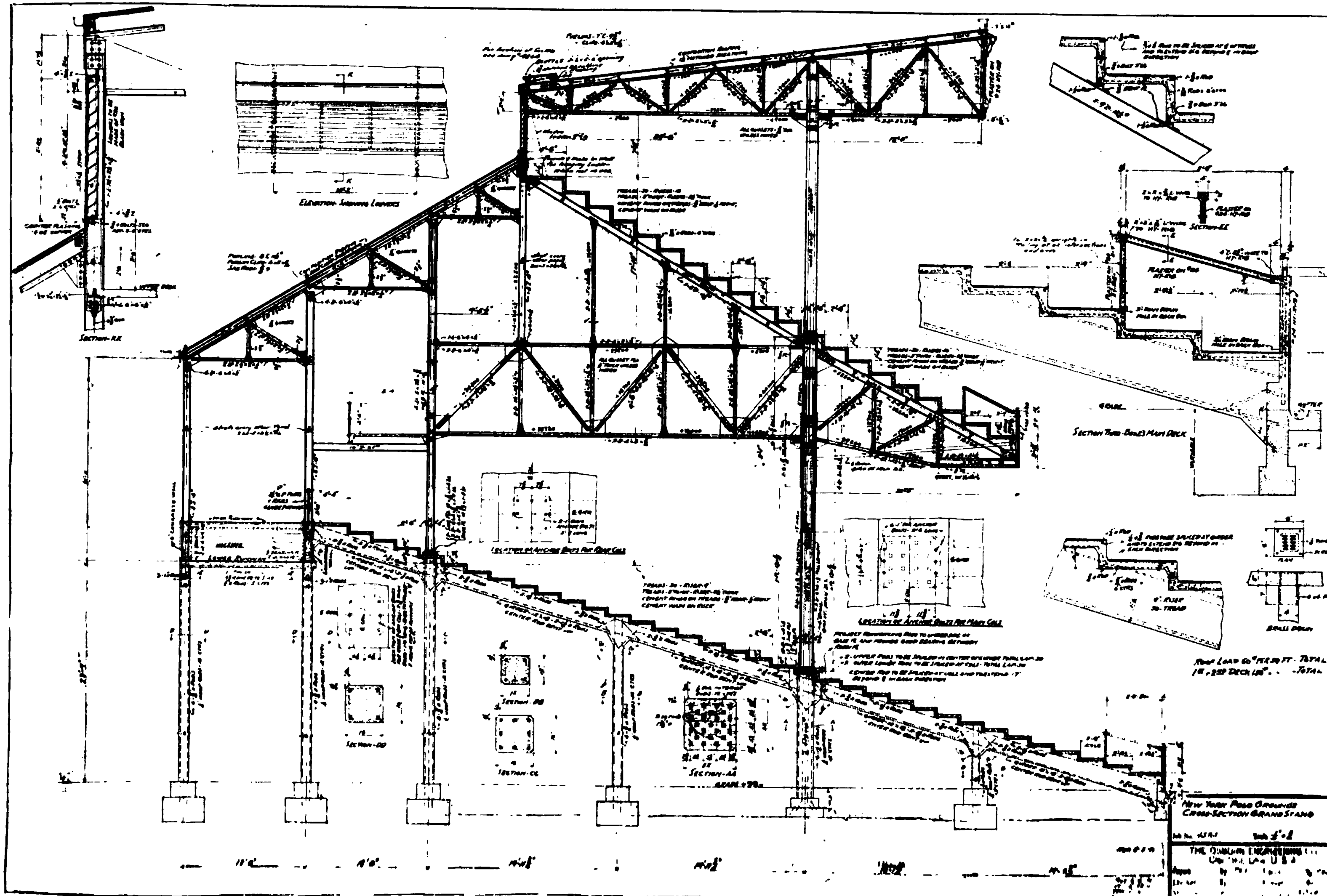
HENRY B. HERTS, Architect

THE popularity of baseball in New York City, and, for that matter, throughout the country, is the occasion for this elaborate equipment to accommodate the tremendous crowds that come to the games during the season. With the burning of the old Polo Grounds grand stand last year, it became necessary to erect new stands for the accommodation of the baseball enthusiasts, and the structure we are now illustrating is a very good model of structural design, with adequate adornment for such a purpose.

The substructure consists of spread, reinforced concrete footings with reinforced concrete piers rising to the level of the first tier of seats. This tier is built of reinforced concrete in the form of a great slab supported by girders across the piers. The risers and treads, 9 inches in height and 30 inches in width, are also built up of reinforced concrete, and furnish the levels on which the seats are placed. Above the first tier the whole construction is open steel framing with the balcony and roof cantilevered out. The balcony treads and risers are also of reinforced concrete carried on steel beams. The runway in the rear of the seats and the approaching runways to the balcony are all cement floored. There is a composition roofing over the 1½-inch matched sheathing.

The ornamentation of this very utilitarian structure takes the form of two decorative courses, one at the balcony level and one at the roof level. The design at the balcony level is a repeated motif, while that at the roof level contains a series of eight shields repeated in successive panels. One end of the stand which is shown in the illustration is finished in decorative form, while the other is left incomplete, to be eventually continued further about the baseball diamond. The seating capacity of the new stand is about 27,000. There are thirty-five rows of seats in the first tier, including the boxes, and twenty in the balcony.

Mr. Henry B. Herts was the architectural designer, the Osborn Engineering Company were the designing and structural engineers, the Snare and Triest Company were the general contractors, and the cement for structural and ornamental work was supplied by the Pennsylvania Cement Company.

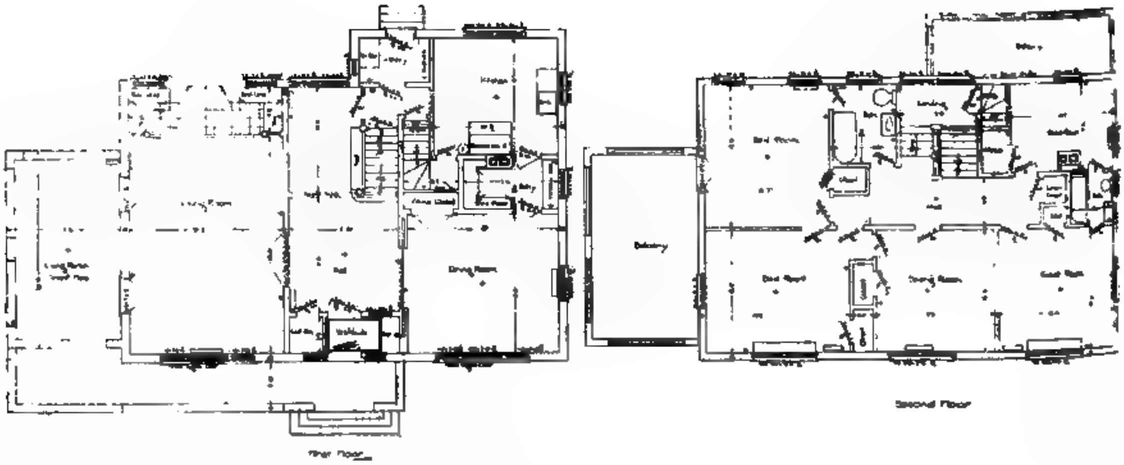


GRAND STAND AT NEW YORK POLO GROUNDS. CROSS-SECTION SHOWING CONSTRUCTION.

General Contractors: The Snare & Triest Co.

The Osborn Engineering Co., Designing and Structural Engineers.

GRAND STAND AT NEW YORK POLO GROUNDS.
General Contractors: The Snare & Triest Co. Henry B. Herts, Architect.
Star Expansion Bolts Used.



RESIDENCE OF MR. JAMES D. POTTS, HIGHLAND AVENUE, GLEN RIDGE, N. J.
Edward V. Warren, Architect.

It is built of Natco tile with exterior finished with a stucco of Atlas Portland cement.

THE RESIDENT VS. THE CORRESPONDENT ARCHITECT

By R. M. DUNBAR

IT is purely a money making system, this planning houses to be built for some one whom the architect knows not and on sites which he has never seen.

There are several firms, however, that offer in the columns of the current magazines, upon the receipt of fifty cents or one dollar, to send one a book in which are beautifully rendered cuts of houses which might be built, but all of which have a price above which the cost of their erection cannot possibly go.

The would-be house owner is expected, upon receipt of the book, to pick from the collection a picture somewhat resembling the house which he is in hope of building for, say, $3,500.

He then carries the book around for three or four days getting the opinions of his friends, supposing, of course, that he has them. Finally, though, he gets out another kind of book, a check book, and sends the amount which is always to be found in big black type underneath each picture, and for which he is to get plans and specifications complete for house No. 284.

Well, we will suppose he receives the plans, etc., by return mail. He calls on his contractor friend, the same evening and after a glance at the plans and a few figures, this gentleman announces that the house could not possibly be built for less than $4,500, more likely touching $5,000.

Utterly disgusted with this man as a friend, our hero travels to another of his contractor friends. This man takes the plans to figure, as he tells Mr. Owner that thing might possibly be built for that figure.

Our friend walks home that night and by the time he reaches his door has just about come to the conclusion that leaded glass in the basement windows would look nice, especially in summer.

The next evening arrives and with it comes contractor No. 2. "I've figured pretty close, Mr. Owner, and I guess by using No. 2 hemlock for Norway pine for the rough lumber we can make it for $3,500."

They go inside and from behind nice black cigars they make several changes in the specifications.

First they change the front stairs from oak to Southern pine; also, wherever stone is mentioned, the contractor confidently explains that concrete should have been specified. Out goes the stone. Cement wainscoting in the bathroom is changed to wooden and 4-inch siding gives place to 5-inch, and then they come to the plumbing.

Lead pipe was a nuisance, the owner was informed, because it would sag with age; so iron pipe goes in, and then, too, there was absolutely no use of wiping the joints. "No?" All right. The pencil puts that away.

When all these and some other minor changes had been taken care of, and after assuring our friend that he probably could keep inside of $3,500, the thrifty contractor left with the specifications, however, safe in his pocket.

The owner got his house, which though only four years old, is steadily falling apart; doors refuse to stay shut, and all through he sees the result of letting the specifications remain in the contractor's pocket. Besides the contract

price, the contractor found it necessary to add some extras which amounted to about $200.

Another friend, not quite so certain as to the kind of a house that he preferred, went to a resident architect, and after a talk, received some sketches which with a few changes became blue prints.

He also received, as did our other friend, a set of plans and specifications, but he kept them, bothered not a bit about the contractors, and once or twice during the construction went out and looked it over. In the end, although it cost him a trifle more for the architect's fee, on the other hand he has a home of which he may well be proud and certain is he that the first hard wind will not blow it to pieces.

There were two other men who builded their homes, many years ago, one on the sand and the other on the rocks. The water came and washed the sand away, but the rocks held firm.

NORTH SIDE BOARD OF TRADE, THIRD AVENUE ENTRANCE.

Builders: American Real Estate Company — Albert E. Davis, Architect.
Plumbing, Heating and Ventilating, George P. Morell.
Interior Marble: Ceramic Marble Works.
Painting and Decorating: Joseph Hilbring.

BUILDING FOR THE NORTH SIDE BOARD OF TRADE

ALBERT E. DAVIS, Architect

THE North Side Board of Trade Building is located at the junction of Third and Lincoln avenues and 137th street in the Borough of the Bronx. Its excellent site was well taken advantage of by the architect in his original designs, and the finished building, though differing in minor details, is a very creditable piece of work. Mr. Albert E. Davis, the architect, was a founder of the North Side Board of Trade, and it is very largely due to his personal efforts that the building was constructed.

The illustration of the entrance shown is that facing Third avenue. This same treatment is repeated for the entrance on Lincoln avenue, and a variation of the treatment is presented in the central entrance to the store which faces upon the Plaza. The two side entrances lead through marble vestibules to a twin stairway which leads up through the central rear portion of the building to the Board of Trade Room on the third or top floor. At this level a lobby surmounted by a dome containing a skylight, precedes the entrance to the Board Room itself.

The American Real Estate Company built the building; George P. Morell did the plumbing and installed the heating and ventilating system; Joseph Hilbring did the decorating, and the interior marblework was done by the Cerussi Marble Works.

NORTH SIDE BOARD OF TRADE. THE THIRD AVENUE FACADE.
Builders: American Real Estate Company.
Evans' "Crescent" Expansion Bolts Used.
Albert E. Davis, Architect.

HOTEL ROGERS, LEBANON, N. H. SUITABLE INTERIORS FOR A HOTEL IN A SMALL TOWN.

Floors: The Marbleoid Company.
Lockwood Mfg. Co., Hardware Supplied by C. M. Hildreth & Son and Hardware Agency Co.

Fox & Bixby, Architects.

HOTEL ROGERS, LEBANON, N. H.

Builder: W. Shelton Swallow Co. Fox & Bixby, Architects.
Star Expansion Bolts Used.

CHURCH OF THE SACRED HEART, 169TH STREET AND SHAKESPEARE AVENUE, NEW YORK

Altars, Statues and Stations: Daprato Statuary Company. Elliott Lynch, Architect.
Plumbing: William J. Flynn
Switchboards: Metropolitan Electric Mfg. Co.
Stained Glass Windows F. X. Zettler

CHURCH OF THE SACRED HEART

ELLIOTT LYNCH, Architect

THE church of the Sacred Heart, with its adjoining rectory, is a good example of what may be developed in church planning upon a city lot. The church proper is at a level, a story above the street, and approached by a wide flight of steps with a double entrance way. A vestibule with baptistry to one side and stairs to the choir loft to the other precedes the nave. The aisles are reduced to narrow passageways, merely furnishing access to the seats. As the sanctuary is approached, the church increases in width, forming shallow transepts. To either side behind the side altars, are sacristries.

The parish house adjoins the church with a connecting passage through the baptistry; its plan is clearly shov the exterior the same building ı is used, a white marble such as tl in the New York Public Library

The builder of this church wa cross Bros. Company. The l Statuary Company made the altars, which are richly carved, marble railing which extends across the church. They also con the statues and the Stations of th which are in full relief.

The stained glass windows wel by F. X. Zettler of the Royal B Art Institute of Munich.

The plumber was William J. and the Metropolitan Electric M turing Co. supplied the switchbc

CHURCH OF THE SACRED HEART.
FIRST STORY PLAN.

Elliott Lynch, Archi

Otis Elevators

The achievement of this Company in perfecting the highest type of elevators has gained for our product recognition as the standard of excellence throughout the civilized world, and it is but fitting tribute to their superior quality that Otis Elevators have been chosen for many of the palatial, world-renowned Hotels and Apartment Houses of this country and abroad; in which are included

Hotel Sherman, Chicago	Hotel Ritz-Carlton, New York	Rector's Hotel, New York
Hotel Astor New York	The Martinique Hotel, New York	Hotel Richmond Richmond, Va.
Belmont Hotel New York	The Emerson Hotel Baltimore	Hotel Bossert Brooklyn, N. Y.
Hotel Taft, New Haven, Conn.	Hotel Schenley, Pittsburgh, Pa.	Georgian Terrace Hotel, Atlanta

and hundreds of others equally well known.

Back of our product is over fifty-five years' experience and success in solving all kinds of elevator problems. We build all kinds of passenger and freight elevators for every purpose—for every kind of power. Otis Elevators have demonstrated they are—

Unequaled for Quality, Safety Efficiency, Economy, and Durability

Otis Elevators should be used for modernizing old buildings and for insuring the greatest convenience, safety, economy and satisfaction in the new.

Without obligation our Engineering Department will supply full information, show the best way to meet specific requirements, and submit estimate of installation cost.
Correspondence invited.

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BOOK REVIEWS

MODERN PRACTICAL DESIGN by G. Wooliscroft Rhead. Cloth, Illustrated. London: B. T. Batsford. New York: Chas. Scribners Sons. Price, $3 net.

This is a beautifully and profusely illustrated volume which seems to have been written as a sort of elaborate text book. In the author's preface he points out the distinction that is commonly made between the pictoral or so-called "fine arts" and the applied arts. It is the latter division which forms the theme of this book. Chapters are given which treat of almost every variety of applied ornament. The first chapter of the book, which the author calls "plant form as the basis of ornament," is a kind of treatise in elementary botany, which is a subject somewhat neglected by artists and decorators as a general rule. This chapter, however, is too condensed to give much knowledge of botany, and treats more particularly of the application of plant forms to design. There is a chapter on wall papers and fabrics; one on book decoration, and it may be mentioned that the book itself is a beautiful example of this branch of decoration. Besides the illustrations of the text, there is a cleverly designed title page, and two chapters, one of which is under discussion, are headed with an appropriate ornamental initial. This chapter deals briefly, among other things, of the subjects of bookplates, illustration of books and the methods of obtaining it, and a very brief description of the process of half-tone engravings is given. There are chapters on stained glass, pottery, metal work and jewelry, woodwork and carving, embroidery, etc., fans and lace and posters.

FIRE PREVENTION AND FIRE PROTECTION. By Jos. Kendall Freitag, B. S. C. E. John Wiley & Sons, New York. Pocket-book size, 4x7 inches; semi-flexible leather; 1,038 pages. Price, $4.00 net.

This book presents to the architect a technical book on elemental and secondary fireproofing for buildings. The author presents the subject in six parts.

The first part deals with fire prevention and fire protection, treating of fire losses and to a considerable extent with the insurance problems involved. It also treats in a final chapter of mill construction.

The second part treats of fire tests and materials, telling of various testing stations and fire-resisting buildings which have furnished instructive information. A further chapter deals with materials of fire-resisting construction.

The third part refers to fire-resisting design and lays emphasis upon the value of correct general design and good planning as a very essential feature in resisting fire. This portion of the work is descriptive and well illustrated by many of the appliances which are in common use in our fireproof buildings.

The fourth part of the book refers to fire-resisting construction and takes up terra-cotta floors, girder protection, concrete floors and reinforced concrete and combination terra-cotta and concrete floors. It also refers to wall construction, roofs, suspended ceilings and furring.

The fifth part deals with special structures and features. There is an application of fireproof construction in theatres, schools, residences, factories, garages, safes, vaults and special hazards.

The last part of the book deals with auxiliary equipment and safeguards. There is a short review of the fire-fighting devices which may be installed in any building, automatic sprinkler systems, standpipe and hose; the necessity of private fire departments, fire drills for employees and the inspection and maintenance of fire protective devices.

Briefly the book presents a very interesting and instructive review of the present standing of fireproof construction and fire protective methods. It will be of undoubted value to the architect and is a book that should find a place in every architect's library.

HENDRICKS' COMMERCIAL REGISTER OF THE UNITED STATES FOR BUYERS AND SELLERS. S. E. Hendricks Company, New York. Cloth, 8x10, 1,900 pages. Price, $10.00, postage prepaid.

The continuous growth of the Commerical Register is evidenced in the present volume. If we refer to the previous issues, we will find a doubling of the number of classifications in a period of seven years. The present edition contains over 50,000 classifications, requiring an index of 122 pages. The fifteenth annual edition required an index of 62 pages, having a little more than half the number of classifications. The scope of the work has greatly increased. In fact, it has grown with the industries which it classifies. As they have increased in magnitude and developed new products, so has the Register increased. Practically every machine, tool, specialty or material is listed. For building and construction there is a heading for every material, specialty, apparatus, machine or tool required, with the names of the firms who supply them under the headings. For the drafting room, for the architect and engineer, for contractors, and for the electrical trade, heating and ventilating, plumbing work, concrete work, and for

(Continued on page 40.)

Art and Architecture

Editorial from "Republic," St. Louis, October 8, 1912.

For the first time in the history of American Architecture a State Capitol design has been selected in conformity with the rules of the American Institute of Architects. Never was there a competition more impartial. The preliminary competition brought forth sketches of sixty-nine different buildings. From among these ten were selected by a jury of experts. An examination was made into the professional and business standing of the ten firms so honored and an honorarium paid to cover the cost of production of complete designs.

The three architectural experts elected from the Institute and the four Capitol Commissioners were a unit in the choice of the successful design. No one of the Commissioners knew when the final choice was made whose design they were approving.

In this important matter, of deep interest to every citizen of the State, Missouri has set an example to the country. It is under such conditions that great buildings are produced and truly monumental architecture made possible. In view of the history of the selection of designs for the Statehouses of certain western Commonwealths, the action of the State Capitol Commission appears the most admirable. —*St. Louis Republic.*

The Journal of the American Institute of Architects is about to appear as a monthly publication, and its field is to be broadened. The editorship is to be in the hands of D. Knickerbacker Boyd, and it is the purpose of the Institute to publish a dignified and serious technical journal supported by contributed articles, both short and continued, on technical subjects and matters of professional interest. It will continue its present position as the official organ of the Institute and will serve as a medium for the interchange of thoughts, as well as the interesting opinions between the various members.

In a recent editorial in the New York Times, attention was called to the building of the new Imperial Capital of India at Delhi. What architectural style will be adopted is difficult to prophesy. There is a cry of "Indian architecture for India," but shall this be Moslem, Hindu, or another from the gamut of styles for which there is precedent in the Indian Empire. Mr. Albert Baker suggests the grafting on of the nobler features of Indian architecture to the classic styles of Inigo Jones and Sir Christopher Wren. "To the artist's creative power must be added sanity of judgment," he further insists. If this last result is really obtained we may look for something really worth while, but a heterogeneous jumble of elephants and many-armed Sivas with Corinthian columns and egg-and-dart mouldings might produce a really astounding effect.

The New York Water Color Club is now holding its twenty-third annual exhibition at the Fine Arts Building in 57th street.

The south and middle galleries are well filled and the general impression a pleasing one.

The adapatability of water color as a medium in rendering architectural subjects is brought out in a number of pictures which can be counted among the best in the exhibition. Among them are Birge Harrison's "Twenty-third St. Morning," and "Twilight in Madison Sq.;" Edmund Garrett's "The Old Homestead;" Lesley Jackson's "A Colonial Doorway"; Paul Shurtleff's "Pont Neuf," and Paula Himmelsbach's little sketch of a church in Athens. There are portraits and impersonal figure studies of good form and much interest, many landscapes of Nature's many moods. and picturesque renderings of fanciful subjects, exploiting some whim of the artistic mind, which give variety and attractiveness to the exhibition as a whole.

A specially appointed committee of the National Conference on City Planning is to conduct this year a study in city planning, taking an area of the outskirts of a growing city of about 200,000 or 300,000 population. The description of the area and the details of the study may be had on application to the secretary of the conference, Flavel Shurtleff, 19 Congress Street, Boston.

Avery Architectural Library.

The new Avery Library building at Columbia University has been formally occupied and opened. It is the gift of Samuel Putnam Avery, Jr., and is occupied by the Avery Architectural Library and by the School of Architecture.

The first and mezzanine floors are devoted to the library and reading room, which, with stacks in the basement, will make provision for 60,000 volumes.

The upper floors at present provide lecture and drafting rooms and offices for the School of Architecture.

The jury appointed by the Court House Board to select designs submitted in the first stage of the competition for the new Court House in New York has chosen ten successful competitors, who are as follows: Howells & Stokes, Maynicke & Franke, Chas. C. Haight, A. M. Githens, Aymar Embury, Grif-

ENGINEERS' DIRECTORY

fin & Wynkoop, K. M. Murchison, Howard Greenley, Wilder & White, Shire & Kaufman, Walker & Gillette, Geo. & Edward Blum, Guy Lowell.

These ten men were selected from among forty-seven architects who competed. The jury consisted of Robert S. Peabody, Frank Miles Day and John Lawrence Mauran. These architects now have the privilege of competing with the architects who were originally invited to submit plans without competition. These were: McKim, Mead & White; Carrère & Hastings; LaFarge & Morris; Tracy, Swartwout & Litchfield; James Riely Gordon; H. V. Magonigle; York & Sawyer; Charles Butler & Charles Morris, Associated; Trowbridge & Livingston; A. W. Brunner; Cass Gilbert, and George B. Post & Sons.

THE ELECTRICAL EXHIBITION AND AUTOMOBILE SHOW OF 1912.

To observe the progress of electrical invention even over the period of a year, is worth while, and those who visited the Electrical Show undoubtedly accomplished what they sought. Electricity as it is applied in the household and for commercial uses was well exemplified. The exhibits of the New York Edison Company were largely educational and the comparisons of the advancement that has been made in the electrical equipment of power houses was illustrated by several very instructive models. The display of electrical appliances for the household—cooking utensils, toilet articles, vacuum cleaners, massage vibrators and other appliances—attracted large crowds. There were two exhibits of household refrigerating machines which while very suitable for a large house or a small hotel, have not as yet reached a standard of perfection suitable for a modest suburban cottage. The exhibits of storage batteries, automobiles and electrical vehicles formed another department that attracted the eye of the manufacturer, as did also the many mechanical devices. The United States Naval Corps had a large and showy exhibit.

The Otis Elevator Company, occupying a space opposite the entrance, had installed one of their inclined elevators, and had it in operation. Other interesting devices were to be seen in the exhibit of the Nelson Valve Company, which displayed some large mechanically operated valves. From the standpoint of electric lighting there were many exhibits, of which the tungsten and tantalum lights furnished a brilliant display. A new carbon filament tube lamp was exhibited—the Rayline lamp—which is of very considerable merit and will undoubtedly come into extended use. There was also an exhibit by the Lighting Studios Company of various patterns of their shades made of Doric ware. This glass gives very great efficiency and perfect diffusion. The beauty of its effects, both plain and in alabaster finish, is such that it has been adopted in many important buildings.

Fireproofing and Fire-Protection

MR. G. H. STEWART

MR. BOONE ON AUTOMATIC SPRINKLERS.

An interesting talk on Automatic Sprinkler Equipments was given by Mr. E. P. Boone, Superintendent of the Automatic Sprinkler Department of the New York Fire Insurance Exchange, on Wednesday, November 6, 1912, at the Insurance Society Library, under the auspices of the Barebones Alumni Association of New York University. Mr. Boone supplemented his remarks with practical stereopticon views which helped those present to a very clear understanding of the subject.

There were about one hundred men present, representing, for the most part, the insurance fraternity and men of letters interested in this topic.

The speaker handled his subject in a non-technical manner and presented a chronological history of the sprinkler as well as the present day practice.

His review of the evolution of the sprinkler head was of great interest, as it showed a wonderful progress in this essential feature, from the Parmelee head in 1878 to the various models of 1912.

From the sprinkler head, Mr. Boone passed in succession to the nozzle discharge from various heads, dry valves and their operation, check alarms, pump supplies (steam and electric), tank supplies, pipe sizes and pipe arrangements for car barns, for storage plants and manufacturing establishments, exposure hazards, open sprinklers and sprinkler failures.

The work that Mr. Boone is engaged in, that of supervising the sprinkler installations throughout New York and Brooklyn, makes him particularly fitted to tell the story.

THE FIRE SHOW.

The date of the Fire Show has been now definitely set as the 21st to the 28th of December, 1912, in Madison Square Garden, New York. A large number of exhibits have been assured and the display of fire-fighting apparatus in actual operation with life saving and safety devices will assure popularity and a large attendance. We have announced in previous issues some of the exhibitors and the nature of their exhibts. We are assured these will be in full and successful operation.

PROPOSED FACTORY BILLS.

The New York State Factory Investigating Commission has prepared tentative drafts of a number of bills which deal with the subject of fire prevention and fire escapes in factories. "Greater New York," the journal of the Merchants' Association, gives the following opinion

"The bills proposed are drastic in their requirements and are of the utmost importance to the factory interests, inasmuch as they will require extensive and, in some cases, radical reconstruction of existing buildings. They restrict the number of operatives that may be employed on any floor in a factory building, regulate the placing of machinery, the arrangement and width of aisles, the size and position of doors, and width of hallways and stairways, and require all stairways to be protected by fireproof partitions extending from the basement to the roof. Minute provision is made as to the capacity and structural character of fire escapes, the number and arrangement of exits, and the safety and adequacy of approaches to and exits from the foot of fire escapes leading to interior spaces."

(Continued on page 26.)

ROCKWOOD

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F. C. KRUMM,
Business Manager.

Sworn to and subscribed before me this 30th day of Sept., 1912.

J. G. BOSWORTH,
N. P.

(My commission expires Mar., 1913.)

TO A THOUGHTFUL READER.

You have just perused, or at least, we hope you have or you are going to, the pages which comprise the central portion of this magazine. There are illustrated buildings of several classes which represent a very considerable outlay of capital for their construction. They are all of them designed to accommodate large numbers of people at one time and they are supposedly of fire-resistant construction, safeguarded in every way to prevent panic or loss of life among the occupants. A great hotel, for instance, that accommodates hundreds and perhaps thousands of guests, a church suited for a great and crowded congregation; how well are these buildings provided for in case of fire? And how much better might they have been protected?

The fireproof shell if filled with wooden trim and combustible material, is just an oven to consume the contents, provided a fire gets sufficient headway. One source of danger can easily be remedied and for this purpose Dahlstrom hollow metal doors were invented, developed and placed on the market. Long use has provided their success and for the protection of contents as well as the occupants

(Continued on page 30.)

a complete equipment of Dahlstrom hollow metal doors, windows and trim is a very wise and good investment. In finish, no objection can be raised to the hollow metal door, for so cleverly is its baked-on enamel grained that the finest wood door is imitated so well as to deceive the eye of an expert.

For the protection of contents we may be accused of being radical, but we do not believe that the automatic sprinkler is such an offensive thing, and in time, we believe that aesthetic prejudices will be overcome and the sprinkler head will take its place among ceiling decorations in our most elaborate buildings.

The H. W. Johns-Manville Company have opened a new water-proofing department under the management of Mr. W. H. Lawrence. This department is to devote its energies specially to the water-proofing necessary in building construction, and we have no doubt that it will be efficiently and advantageously operated.

WOMAN TO FIGURE IN FIRE SHOW.

The importance of women as a factor in fire prevention will be an important phase in the organization work of the Fire Show, which, Dec. 21 to 28, inclusive, will occupy Madison Square Garden. Domestic fire prevention is rapidly being reduced to a science by expert specialists, and through women's influence with women, children and servants disseminated at the Fire Show, thousands will be educated and endowed with the proverbial ounce of fire prevention. Good housekeeping with its inclusive of neatness and cleanliness means the absence of inflammable rubbish in corners, closets, and out of the way rooms, which so greatly increases the fire hazard. Superheated attics have caused many fires. Ordinary matches will ignite at 110 degrees Fahrenheit. Fireproof installation of stoves means care, more than cost. The fire peril is just as great in many metropolitan residences as in frame suburban and rural homes, because of conditions that intelligence and care would obviate.

Industrial Progress

HOTEL FLOORINGS.

Cleanliness in a hotel is a desirable feature and, quite interestingly, a modern one. It apparently never occurred to our ancestors that sanitation in the restaurant and the living room was quite an attractive feature and one that would make an appeal to the passing guest. However, cleanliness is now getting popular and we find it exemplified in many ways. Sanitary floors—for the floors collect the greatest amount of dirt—are a prime necessity, and floors that have no cracks, are waterproofed and are most readily cleansed are of the greatest value. As an example, a small hotel, the Hotel Rogers, at Lebanon, N. H., is floored through its major portions with marbleloid flooring, a durable sanitary floor that is soft under foot. Unlike a concrete floor, it does not dust, and when laid with sanitary curved bases it is the most desirable floor conceivable for all public rooms. It is produced by the Marbleloid Company, 47 W. 34th St., N. Y. City.

The Star Expansion Bolt Co., of 147-49 Cedar Street, New York, has just issued a pocket size booklet containing illustrations, descriptions and list prices of the various toggles on the market. A copy of this booklet will be sent upon request.

S. JARMULOWSKY'S BANK.

This building is located at 54 Canal Street, New York City; and as seen from the Willimsburgh Bridge in crossing, it stands up as the highest structure in the surrounding neighborhood. It is a twelve-story structure, and occupies the acute angle between the streets. The architects, Rouse and Goldstone, have designed a rather striking structure for the location.

The Bankers' Building Bureau were the contractors for the interior. Voska, Foelsch and Sidlo, Inc., did the interior marble work, and the Penn Brass and Bronze Works constructed the bronze banking screen. Kertscher & Co. did the interior woodwork, and Robert Arnstein did the painting and decorating. The ornamental iron work was done by A. Perlman Iron Works, Inc., and "Star" ball bearing door hangers were used.

FLAT FINISH WALL PAINTS.

It is generally conceded that, while some wall papers are extremely attractive, and tapestries have a charm all their own, the most artistic finish for a wall, that which gives the best background for pictures and the best setting for furniture and rugs, is a plain, tinted, flat-finished wall. There are unfigured papers—cartridge papers—but the very best results are obtained by means of paint. It is possible to obtain an oil paint which dries absolutely flat, that can be washed if necessary without in the least injuring the most delicate shade of it, which doesn't fade, and which can be applied in a limtless variety of shades and tones. If a large, plain wall surface seems a bit monotonous, a stencil pattern used with judgment gives all the variation needed. For a private house this decorative aspect is the one that receives most consideration, but for hosptals, hotels or other buildings this consideration is supplemented by others. A wall so finished is absolutely clean and can be kept so. It is sanitary. It can be fumigated without injury to the paint. It can be cleansed by washing with soap and water, in a very short time, and with little expense.

"Memphi Fresco Paint," which is manufactured by the De Soto Paint Manufacturing Company of Memphis, Tenn., is a very high grade fresco paint. It is an oil paint which, however, dries absolutely flat, soft and velvety. This result is obtained by means of a special process of treating the linseed oil so that it dries wthout gloss. Full partculars can be obtaned upon application to the De Soto Paint Manufacturing Company at the address given above.

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AUTOMATIC DUMBWAITERS.

The modern dumbwaiter, an electrical driven device with motor connected by worm gear to a winding drum and controlled by switches, which are push button operated, is rapidly taking the place of the old-fashioned dumbwaiter with all its inconveniences. The simplicity of an electric operated dumbwaiter with its push button control is patent. Beside the doorway in the basement of an apartment house for instance, there is a bank of buttons, marked Up, Down and Stop, and a dial indicator telling the floor to which the car has risen. The Up button sets the waiter in motion, the pointer indicates the floor and upon pressing the Stop button, the car is brought to a standstill. A reverse operation with the Down button lowers the car. Other styles have electric illuminated glass discs which trace the travel of the car to the person operating it in the basement.

Similar devices with larger cars are manufactured for invalid lifts, and these are suitable for carrying three or four persons. They are extremely serviceable in residences, private hospitals and other buildings in which a small elevator is required.

The Jas. H. Roberts Elevator Company, established in 1872, are manufacturers of dumbwaiters, invalid lifts and elevators of larger capacity, electrically driven and operated. Their address is 430 West Broadway, and they will be pleased to give estimates.

Lockwood and Almquist, time service engineers, 1 Madison Avenue, New York City, have recently purchased the entire assets of The Prentiss Clock Improvement Company.

This firm is now manufacturing master and secondary clock systems, program clocks, 60-day calendar clocks, and special timing devices of all descriptions.

They have recently perfected a machine known as the Automatic Elevator Dispatcher. The purpose of this mechanism is to increase the efficiency of elevator operation in large buildings by means of automatically ringing signals in the various elevators, both at the bottom and top floors, thereby keeping the cars scattered uniformly through the building.

(Continued on page 39.)

CHANGES IN THE OFFICERS AND BOARD OF DIRECTORS OF THE JOSEPH DIXON CRUCIBLE CO.

At the regular monthly meeting of the Board of Directors of the Joseph Dixon Crucible Co., held Monday, October 21st, the following changes in the officers and Board of Directors were made on account of the death of Vice-President, William H. Corbin:

Mr. George E. Long, former treasurer, was elected vice-president, to succeed Mr. Corbin; Mr. J. H. Schermerhorn, former assistant secretary and assistant treasurer, was elected to membership in the Board of Directors and treasurer of the company. Mr. Albert Norris was elected to the office of assistant secretary and assistant treasurer.

WATERPROOFING.

The Monroe Building, which is illustrated in this issue, was waterproofed with Ceresit. What is Ceresit? A knowledge of Ceresit would be to your advantage and we will tell you a little about it. It will effectively do the work of waterproofing with less labor, expense and economy of time than anything else, and it further gives the assurance that the waterproofing is done permanently. It has never failed to do its work, because it is an integral part of the construction, being incorporated in the concrete mass, giving the concrete a greater density. Ceresit is a cream white paste which is added to the water used in mixing concrete, giving it uniform distribution throughout the mixture. No matter how thick the wall, Ceresit is through and through it, but the water is stopped at the surface of Ceresit proofed concrete. It keeps the water out of the Monroe Building and it has kept the water out of many other basements, including the Harper Memorial Library Building, which will be illustrated in our next issue. It is a most satisfactory waterproofing material for foundations, tunnels, aqueducts, walls, cellars, swimming pools, tanks, and in fact every form of construction that is to be resistive to water.

The Ceresit Waterproofing Company, of 80 West Adams street, Chicago, will tell you more about Ceresit in an interesting and instructive manner.

AN INTERESTING STRUCTURE.

The Monroe Building, Chicago, which is illustrated in our inside pages, is on the exterior a very attractive building. Its hallway gives a forecast of an attractive interior, and when we approach the upper corridors and individual offices we realize the architects have been unrestricted by the owners in producing a building which will meet the demands of those who wish the most attractive offices. Aside from the planning and lighting, the most important feature in the appearance is the decoration and tinting, and this subject has been left in the able hands of W. P. Nelson Company, Chicago.

Book Reviews

(Continued from page 18.)

hardware and other supplies, there is a complete list of every conceivable material that is required by these industries. Even the quarry is covered and every conceivable class of machinery.

There are over 385,000 names and addresses and, making due allowance for the magnitude of the work, there is a remarkable degree of exactness. To the manufacturer the book is invaluable, to every one in the building trade it is a necessity, for it gives the names of the material and supply men in every part of the country, being of great assistance in their specification work. Its price would be paid for on one small job out of town, where it was necessary to get outside figures.

THE CATHEDRALS OF ENGLAND AND WALES, by Francis Bond. Fourth edition. Cloth. 494 pages, 5x8 inches. 200 photographic reproductions and numerous plans. London: B. T. Batsford. New York: Charles Scribner's Sons. Price, $3 net.

This book is really traveling under a disguise when it appears as a fourth edition, for those who are familiar with the three previous editions will find such a change in this that it really seems like a new book. Needless to say, this change is for the better, a vast improvement in fact. The photographs are largely new, and the reproductions, though small in scale, are excellent in the extreme, being fine screen half-tones reproduced on a dull-surfaced paper, giving soft effects which are extremely clean and clear in their detail.

Beside the photographs, for the student of cathedral architecture there is the pleasing addition of the plans which are all drawn to uniform scale, 100 feet to the inch. Further, the author has so completely revised his ideas and enlarged his horizon in the dozen years since the first edition appeared, that the text of the book is also almost completely rewritten and the scheme changed. Whereas formerly the history of every cathedral was thrust into Mr. Rickman's four categories, the author feels that this is now untenable, and he has treated the architectural history of each cathedral more or less as an entity.

PROBLEMS IN FURNITURE MAKING, by Fred. D. Crawshaw. Fourth edition, revised. 6x9 inches, cloth binder. The Manual Arts Press, Peoria, Ill. Price, $1 net.

This book, which is essentially a collection of working drawings of furniture, shows designs adapted for construction in high school manual training classes. The book wll also appeal to the home craftsman, and it is an extremely practical book, as the furniture shown is suitable for use in any home.

The text which was useful in former editions has been rewritten and elaborated, and

(Continued on page 42.)

Residence W. C. Sanderson, South Orange, N. J.

the author's selection of projects, designs and notes is of the best. The plates consist of a series of dimensional drawings, giving an exact lay-out of work for all of the pieces of furniture presented.

REINFORCED CONCRETE CONSTRUCTION. Vol. I. Fundamental Principles, by George A. Hool, S. B. Cloth. 254 pages, 6x9 inches. Illustrated. The McGraw-Hill Book Co., Publishers. Price, $2.50 net.

This volume forms one of a series of three volumes which deal with reinforced concrete construction. As indicated in the title, the first deals with the fundamental principles, and it is the primary purpose of the series to have the books used for extension teaching or correspondence teaching, although the books are suited to other uses as well. The book includes numerous tables and diagrams to facilitate the calculation and design of reinforced concrete structures. The information from which the book has been compiled has been gathered from standard sources. It contains in the first part, under the head of "properties of the material," chapters on concrete; steel; concrete and steel in construction. The second part covers the theory and design of slabs, beams and columns; rectangular beams; slabs, cross beams and girders: columns; slab, beam and column tables and diagrams; bending and direct stresses.

In general, the book follows the usual methods of concrete construction, and its teachings have some of the deficiencies which are to be found in all text books, but as a short course in construction the work seems to fulfill its purpose.

THE DESIGN OF STEEL MILL BUILDINGS and the Calculation of Stresses in Frame Structures, by Milo S. Ketchum, C. E. Third edition, enlarged. Cloth, 6x9 inches, 562 pages, 270 illustrations and 66 tables. The McGraw-Hill Book Company, Publishers. Price, $4 net.

The architectural and engineering professions are already quite familiar with Mr. Ketchum's work on steel mill buildings. However, this third edition is brought up to date, and there are important additions which greatly increase its value. Three chapters—stresses in frame structures, stresses in bridge trusses, and specifications for steel frame buildings—have been revised, rewritten and enlarged, and many illustrations of the book have been redrawn in addition to the general revision and additions to the whole text. The Appendix III., containing 78 pages, 30 tables and 24 cuts, covers structural drawings, estimates and designs. It is divided into five chapters and is really a small additional book bound into the volume with the main text.

It is a very valuable compendium. To those not generally familiar with the work, it may be said that this book provides a short course in the calculation of stresses in frame structures and gives a brief discussion of mill building construction. It supplements the elementary text books and forms an introduction to the elaborate engineering treatises on bridge design.

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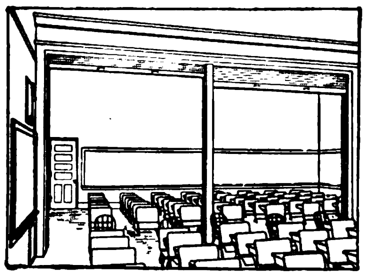

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Architecture and Building

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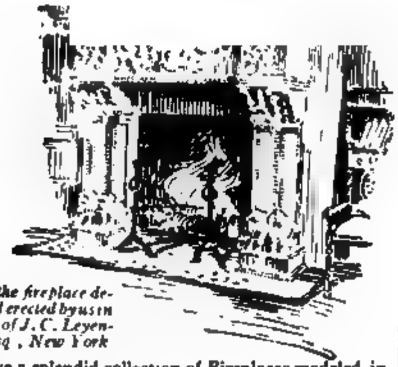

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ARCHITECTURE AND BUILDIN

A Magazine Devoted to Contemporary Architectural Construction

VOLUME XLIV. DECEMBER, 1912 *NUMBE*

THE ARCHITECTURE OF LOUIS H. SULLIV

By THEODORE STARRETT

WHEN Mr. Andrew Carnegie recently stirred up the discussion of the subject of the world's twenty greatest men, a writer in "The Builder" published in London, has this to say:

"Mr. Carnegie's list of twenty is challenged. It gives us hope when it is suggested that sculpture, painting and music should be represented. Some of the other contributors who include Leonardo da Vinci and Michelangelo, do not say in what capacity they are named, though we are inclined to say that their work as architects was not considered: for in the epitome of votes, Michelangelo, half-way down, is described as 'painter and sculptor.' Is this more evidence of the general unconcern about architecture, or cannot an architect be found to rank with engineers, inventors, soldiers, statesmen, authors, and others who have caught the public eye?"

The thought is an interesting one. Is there indeed no architect in all history, who, as an architect, is entitled to rank with the supremely great? Is ther ing or dead, an architect whose me will not pass almost as quickly a body turns to dust? Not even the answers.

THE GOLDEN DOORWAY, TRANSPORTATION BUILDING, WORLD'S FAIR, 1893.

Architecture is a much misunder thing. The title of architect seer carry with it a amount of re. The profession most honorable Not so intimate commonplace a profession of law, or medicin more stable—les hemian if you —than that of painter or the s tor. There is posed to be bread and butte tached to it the sister arts For all that it mystery and my is not liked in days. We have rived at the ag advertising, the age of iconoclasm. newspapers and magazines tell e thing. There's no more privac secrecy. The architect has to deal the general public more and more. much longer will he find praise his fellow architects of any use to

Membership in this or that mutual admiration society will not gain him commissions. He must turn about face and try to please the public.

Maybe this won't be such a terrible thing either. The public is learning and learning fast. Cultured men and women who are not architects are beginning to talk to the public about architecture. Their position is unbiased and their advice is taken on its merits. Here is what Mr. Guglielmo Ferrero, the great Italian commentator, has to say about the subject in an essay published within the last four or five months:

"Man is not yet satisfied. He finds pretexts and motives innumerable for complaint. Among them, the one oftenest repeated, is that the world is growing ugly. If in our cities there stands yet some beautiful quarter, it is almost always old. In historical cities the new parts are shocking. And cities quite new, especially those coming up during the last century in America, appear to an artist's eye oftenest like an antechamber of the Inferno.

THE AUDITORIUM, CHICAGO

"Architecture is become the mother of monstrosities. Sculpture and painting are reduced to the condition of wandering orphans that hard times have driven from their former home.

"They know not where to go! Once they were the two supreme among the decorative arts. In days when the multitude willed to have cities and monuments adorned, they had a definite purpose to fulfill; they knew where to place their works. To-day, with a thousand artifices they must wring orders out of the neglectful ill-will of an epoch whose monuments and decorations seem rather a superfluous load than a beautification.

"The artistic mediocrity of our time is surpassed only by the superficiality and confusion of our tastes. What seems supremely elegant and handsome one year is despised, neglected, forgotten, the next. All the styles of the past and the present gyrate before us like the scenes in a cinematograph moved by changeable fashion. Every scene is admired for a moment, then forgotten by the restless fickleness that is hunting everywhere for the beautiful, nowhere to be found."

I have no patience with those who have found fault with American architecture, because I have noticed that generally the fault-finders were architects themselves, and oftentimes those who were loudest in abuse before they had had an opportunity to design and to build, having once secured a commission, would build more "monstrous" buildings than those which they criticized. It has seemed to me that the faults of our architecture were the faults of our day, of our race, of ourselves, and as well might one seek perfection in human nature itself as to that function of humanity—man's architecture. Viewed thus, if man is fallen, so is architecture. Why be harsh, or unkind, or critical with our architecture any more than with each other?

THE CONDICT BUILDING, BLEECKER STREET,
NEW YORK.

But Mr. Ferrero's words apply to European as well as American architecture, even though he may mean them specially for us. It is true that monstrosities are perpetrated in the great European cities in spite of the fact that they do not have to deal with the skyscraper, as we do here in America.

The skyscraper has been called the Chicago building and I think rightly so. Chicago started the skyscrapers. At the time of the World's Columbian Exposition in 1893, they were not to be seen anywhere in America except there, and the distinguished visitors to that great show had the chance to see them in all their glory, for the Masonic Temple, as tall and as big as any since, the Auditorium with its tower sixteen stories high, the Monadnock Building and many others not so high, but still real scrapers, were on exhibition outside the grounds.

Two of the young architects in Chicago in those days were John Root, who died just as he finished the planning of the World's Fair, and Louis Sullivan, six years his junior. Sullivan had been a student at the Ecole des Beaux Arts and he brought to his work a knowledge of the French architecture, which he used just as an educated man nowadays uses Latin. But he did not try to talk Latin to the Americans. He talked American and maybe he will some day be recognized—in fact I think he is beginning to be recognized—as an architect whose name would be put in the list of twenty, by a public that has been going to school for the last few years.

We find Louis H. Sullivan in partnership with Dankmar Adler, who was the Burnham of his firm, designing and building in 1889, at 33 years of age, the Auditorium, a building which even at this day is one of the most remarkable structures in the world. A combined theatre, hotel, office building and tower, whose size alone must have made it a "record holder" for many a day, and whose fame doubtless might have been kept more before the public had not the press agent been busy with other things.

Now, it may be noted that there are other people than the critics who are finding fault with American architecture. I refer to the authorities. The first time I noticed the interference by the authorities with architectural frenzy was in Boston, staid, common-sense old Boston. You know, they have only one skyscraper there, the Ames Building, designed by H. H. Richardson. This building is 14 stories high, as I recollect, and has a cornice which projects about six feet beyond the building line. Mr. Richardson wanted to make a bigger cornice but his builder, Mr. Norcross, protested, so the six feet, or whatever it is, was a compromise. When the city fathers saw this building finished and walked underneath that frowning construction they decided that they would have no more of them, and they passed laws in restraint of their height. They also forbade wide projecting cornices, and as a result Boston is a town whose buildings look like a man with a too narrow brimmed derby hat on. Then they drew the line on projections that obstruct the sidewalk. This was at least ten years ago. Owners of buildings in New York are just now paying to the tune of a good many hundreds of thousands of dollars for the removal of porticoes, stoops and other excrescences on the fronts of buildings along Broadway alone with no loss to Art, that I can discover.

The Auditorium, built almost twenty-five years ago, was so truthfully constructed that no part of it would conflict with the present ordinances of the City of New York with respect either to sidewalk obstructions or projecting cornices, for its architect then, even as

THE PRUDENTIAL BUILDING, BUFFALO, NEW YORK.

now, preached and practiced the doctrine of utility and truth. The Auditorium building may be said to be twenty-five years ahead of its time, and yet it is a thoroughly conventional building in all its general details. There is nothing strange or startling about it, and particularly is it notable for the almost complete absence of ornamentation. Utility is there in every line of it; even the balcony over the entrance on Mic
Boulevard has its purpose. Onl
cently have the people of America
in the newspapers pictures of the
dential candidates addressing the c
from this very balcony.

The Auditorium was finished in
In 1893, in the Transportation Bu
at the World's Fair, Sullivan again
a demonstration. In this building

signed on strictly utilitarian lines, he had no more of conventionality than would have been used in a peasant's hut: the walls were flat; the wide overhanging eaves served their purpose of protecting them. The sensation about this building was color, bright and gaudy, helped by a profusion of low relief ornament.

The Chicago World's Fair marked two things for America—one, the revival of Graeco-Roman-Italian architecture, the other, the sprouting of the seeds of an American architecture, namely, the architecture of Louis H. Sullivan. From that one Transportation Building and the work of that one man, thirty-seven years old at the time of the opening of the Fair, has sprung an architectural style which will some day overthrow the conventional and artificial style in which the French-trained American architects are so fond of working. When that day comes perhaps the lay critics, the Ferreros of the future, may find something to praise in our buildings and in our architecture.

What absurdities in construction modern architects have to answer for, to be sure! In order to use the classical components the ground stories are made too dark, and very often the story heights are disarranged. Windows are made too narrow and too low, to make room for the architecture, I suppose; then at the top are constructed vast overhanging members to preserve some memory of the ancient architectural order. The whole outside of the building is deformed to fit the preordained rules of architectural composition. Or perhaps the building is designed with more common sense, the windows are made large enough, and the ground story piers are made small to let in the light where it is needed, but over the whole structure are dabbed and fritted architectural features of some style or other Sullivan has been imitated by all sorts of men. In residential work, which he says he is not interested in—and who can blame him?—he has been copied by thousands, and the copies may be said to be as good as the original. In skyscrapers he has been copied by hundreds, and some of the concoctions are terrible to say the least. Sullivan himself has been prone to the use of too much ornament, but in his own works the underlying idea is ever present. His imitators, however, almost invariably mistake the shadow for the substance and spoil their work by their poor guessing. The Prudential Building in Buffalo has been copied in that same town, in a structure that is enough to make the angels weep, and if Mr. Ferrero saw it he would say that Sullivanism was the worst of all. In Buffalo too, out near the N. Y. Central tracks, is a soap factory—but why mention names, or hint of unpleasant things?

New York City has one of Sullivan's greatest designs, the Condict Building on Bleecker Street, a building which, however, shows some of the exuberance of Sullivan's youthful ideas; it has too much ornament, but viewed from a distance, the ornament fused and softened, and in spite of it the plastic beauty of a truthful structure is there for every man to see.

There are several buildings in New York of recent design that seem to show the influence of this Condict Building; for instance, the West Street Building, which is spoilt by the conventional notion that the façade must have a large proportion of its top part made up into a "different administration," so to speak. The Woolworth Building is, as I understand, an outgrowth from the West Street Building, Mr. Woolworth having admired the Gothic style of that structure. What divinity it was that induced

the architect of the Woolworth Building to make "one administration" of it from the bottom to the top should be most devoutly thanked. The thing that makes the Woolworth Building great is the bold truthful leaping of the lines of the piers from the bottom to the top. If the balconies which serve for a cornice for this structure, up at the roof instead of a quarter of the way down, as in the West Street Building, had only been omitted the building would be better still. Those projecting balconies do not belong. Fifty years hence the authorities will probably order them to be removed as a menace to the passers-by in the streets.

This is the age of advertising, advertising is simply another nam enlightenment. It is the heral democracy and in the last analysis the means of sifting the true fron false, the genuine from the spui Genuine Sullivan buildings are b ning to be differentiated from the s ous ones and Sullivan's fame is m ing on. Some of the great adver should practice what they preach. should refuse substitutes. The que is, what great genius for publicity now have Sullivan build him a buil What great advertiser will becom proud possessor of a genuine Ame skyscraper?

IN THE ADAM STYLE.
Warren & Wetmore, Architects.

HARPER MEMORIAL LIBRARY

UNIVERSITY OF CHICAGO

SHEPLEY, RUTAN & COOLIDGE, Architects

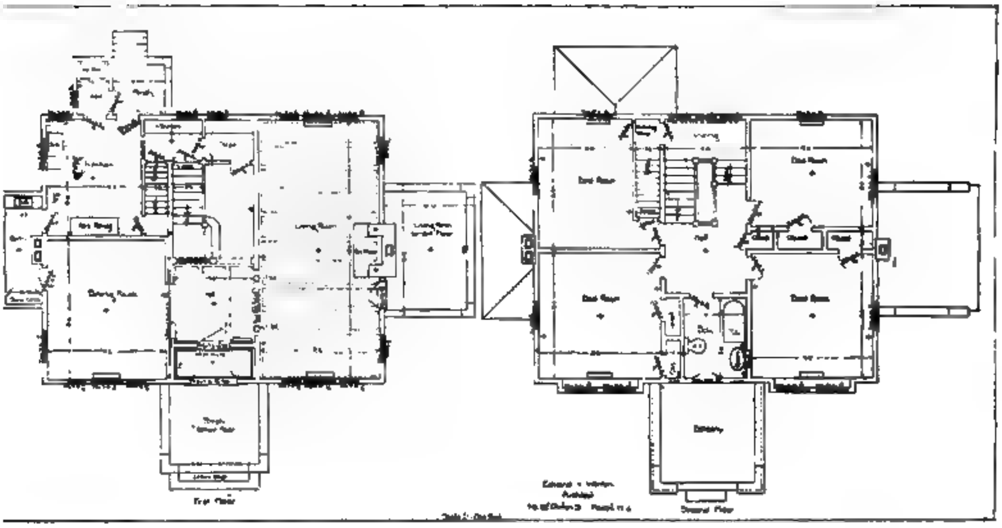
THIS commemorative building has been erected and named in honor of William Rainey Harper, the first president of the University of Chicago, and it forms the central building of that group of structures which faces on the Midway Plaisance. It was started in the beginning of the year 1910 and finished in June of this year, being erected at a cost of about $800,000, including the furnishings. The building, designed by Shepley, Rutan and Coolidge, is styled as English Gothic, inspired by examples in Cambridge and Oxford. The building is of three stories with six stories in the two towers which are 135 feet in height. The first floor is occupied by class rooms and executive offices; the second by administrative offices and working rooms of the library; the third by the main reading room with the catalogue room and delivery room in the west tower. The east tower contains the stack which is built upon its own foundations, separate from the building. The basement used for storage is carefully waterproofed and dampproofed with "Ceresit" to protect its valuable contents. Bridges at the level of the reading room floor connect the library building with the law building and the Haskell Oriental Museum building, giving access to their libraries. In each tower there is a passenger elevator and two stairways.

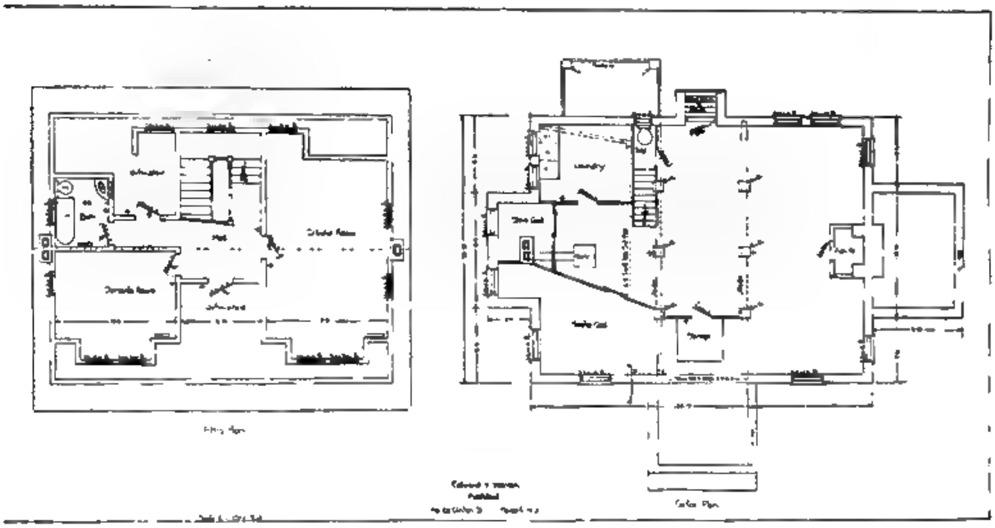
The architectural detail of the building is worked out with great care. Finished in stone within and without, there are numerous carvings of significant meaning—the marks of the early printers, coats of arms of universities, inscriptions, and symbolic and ornamental designs inherent to the Gothic style.

SCREEN AT EAST END OF READING ROOM THIRD FLOOR

HARPER MEMORIAL LIBRARY, VIEWS FROM THE NORTH AND FROM THE SOUTHWEST.

Waterproofed with "Ceresit." Shepley, Rutan & Coolidge, Architects.
Evans' "Crescent" Expansion Bolts Used





RESIDENCE OF MR. CLINTON McCORD.

:UEC Stationary Vacuum Cleaning System. Edward V. Warren, Architect

RESIDENCE OF MR. CLINTON McCORD.
Edward V. Warren, A

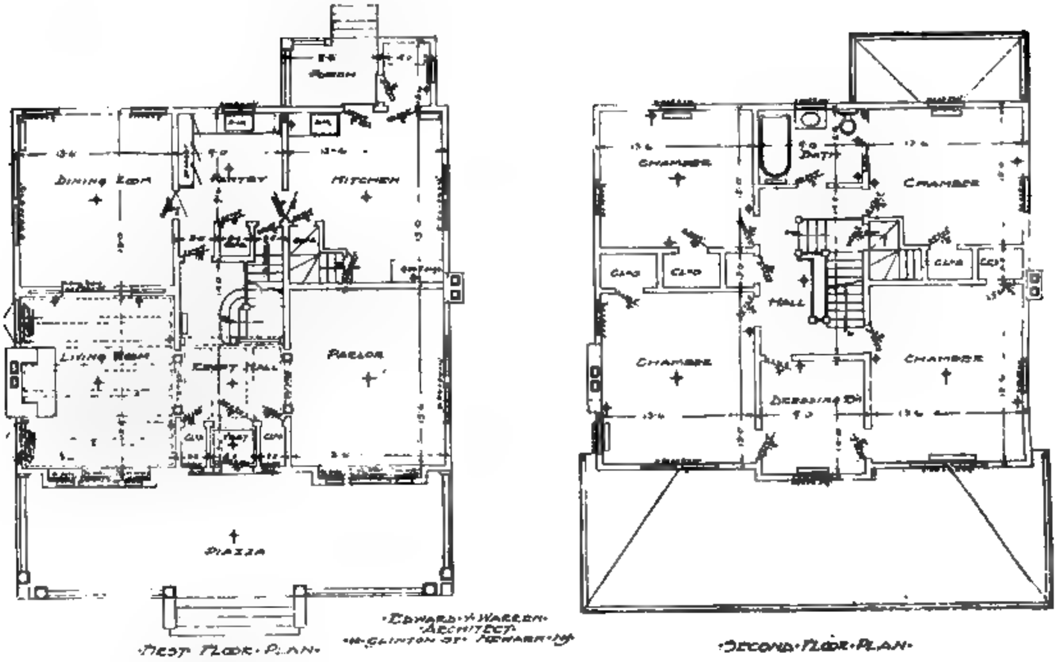
THREE RESIDENCES AT EAST ORANGE,

AT East Orange, N. J., are to be found three houses all designed by Edward V. Warren, and built by Dr. S. L. Good. The first house is finished in stucco on galvanized wire lath, supported by the usual wooden framing. The stucco is made of white river sand and white cement and forms a clean contrast to the green Spanish tile roof. The living room is finished in Circassian walnut and the hallway of Colonial treatment in mahogany and white. The house is steam heated, has both gas and electric light, and has a vacuum cleaner system piped in; the "TUEC" stationary vacuum cleaning system being installed in this and the two other houses.

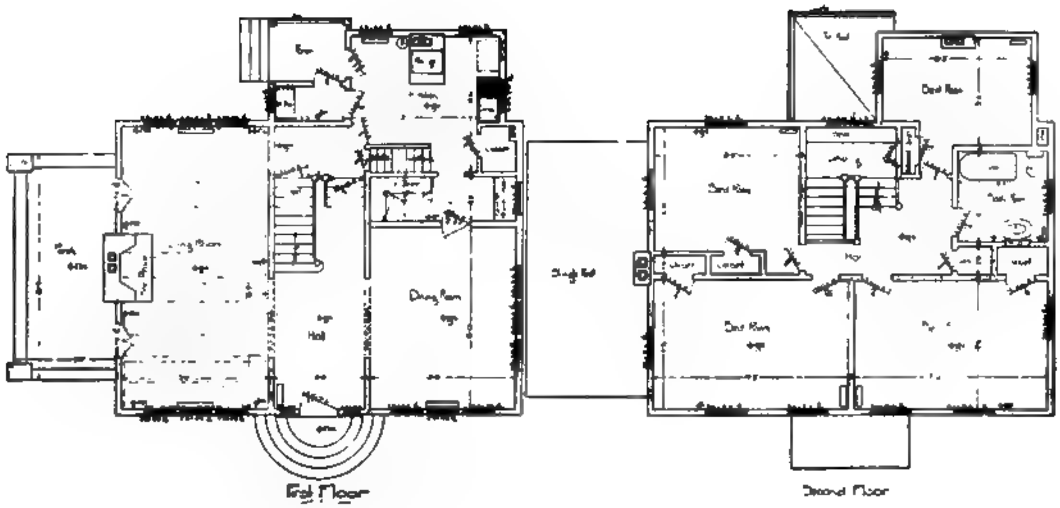
Dr. Good's house is frame, with wide clap-boards, and is of New Colonial type. Its square plai economical and commodious. cated on North Grove street Mr. McCord's residence.

The residence for Mr. Willi art Hess is on Vernon plac finished in 10-inch wide cla painted white with a green roof.

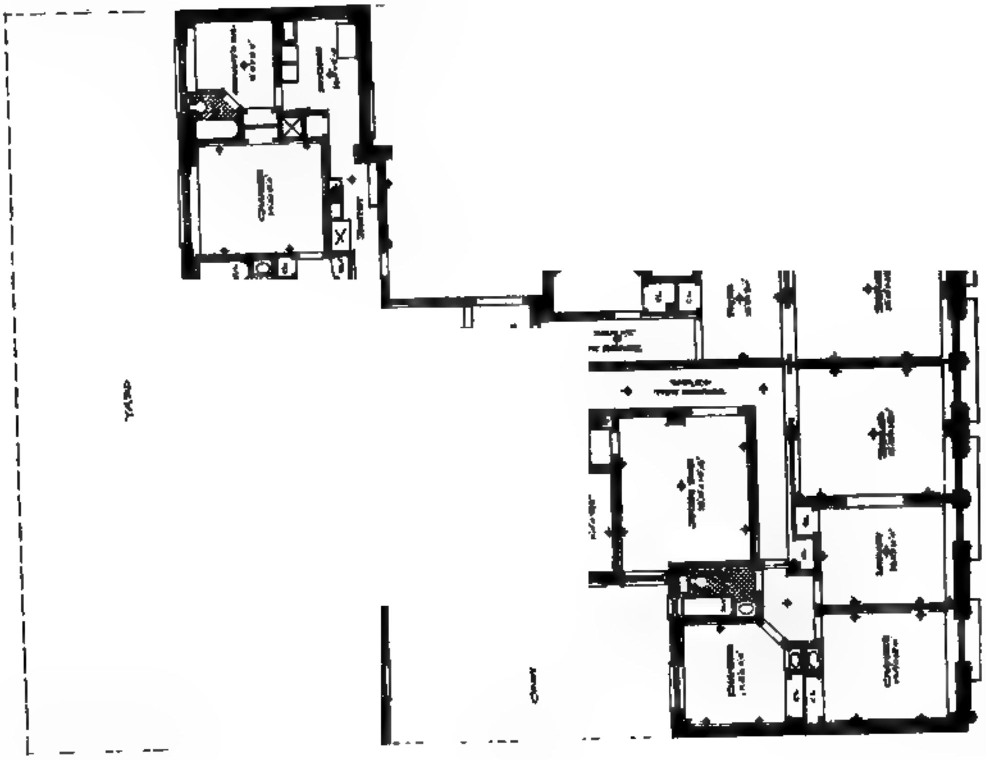
Adjoining the living room i enclosed porch, suitable to be winter for a sun parlor. The finished in white mahogany trim, with quartered oak throughout and tile bathroom. seven rooms and a bath, and cost about $7,000 to build.



RESIDENCE OF DR. S. L. GOOD.
TUEC Stationary Vacuum Cleaning System. Edward V. Warren Architect.



RESIDENCE OF MR. WILLIAM S. HESS.
TUEC Stationary Vacuum Cleaning System. **Edward V. Warren, Architect.**



Builders: H. Crystal & Son

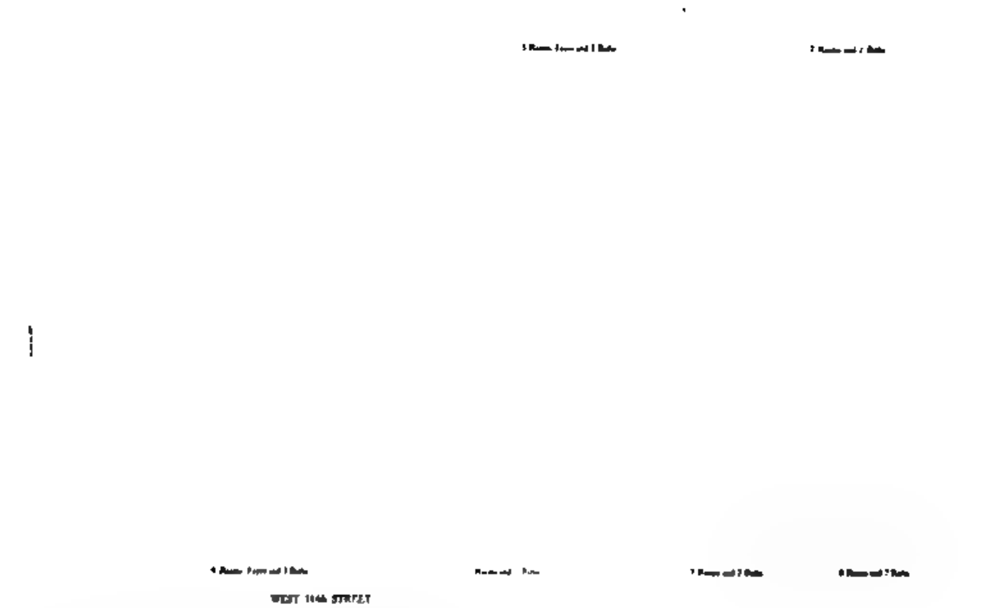
THE PETER MINUET, 26 CLAREMONT AVE., NEW YORK.

G. Ajello, Architect.

THE PETER MINUET,
G. Ajello rchitect.

THE HAMILTON.

Spencer Turbine Vacuum Cleaning System.
Otis Elevators.
Architectural Terra-Cotta: New York Architectural Terra-Cotta Co

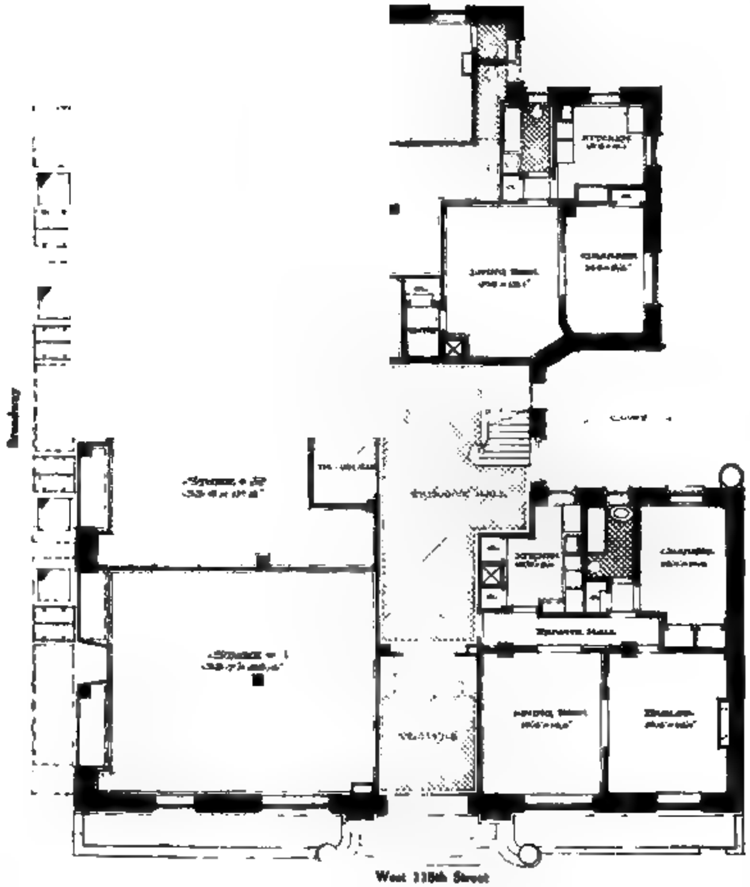


THE HAMILTON, RIVERSIDE DRIVE AND 114TH STREET.

Builders: A. C. and H. M. Hall Realty Co — G. Ajeilo, Architect.
Interior Marble: Voska, Foelsch & Sidlo, Inc.
Interior Woodwork: Jamestown Mantel Co.
Lighting Fixtures: Consolidated Chandelier Co.
Stained Glass: Spiers-Lederle Glass Co.

MARQUISE OF THE LUXOR.
Architectural Terra-Cotta: N. Y. Architectural Terra-Cotta Co.
Heating and Ventilating. E. Skannel
Interior Marble: Voska, Foelsch & Sidlo, Inc
Bathroom Accessories and Hoegger "Surelocks": J. A. Hoegger.
Decorations: Alberto Buccini.

ENTRANCE OF THE HAMILTON.
Corbin Hardware. G. Ajello, Architect.



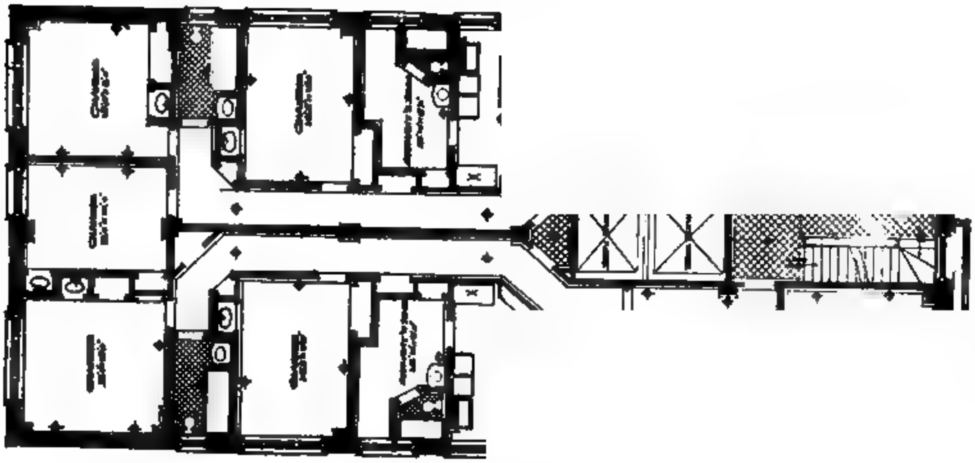
PLAN OF FIRST FLOOR

THE LUXOR, 600 WEST 115TH STREET, NEW YORK

G. Ajello, Architect.

Builders: Paterno Bros., Inc.
Interior Woodwork: Kerlscher & Co.
Painting: Andrea Ognibene

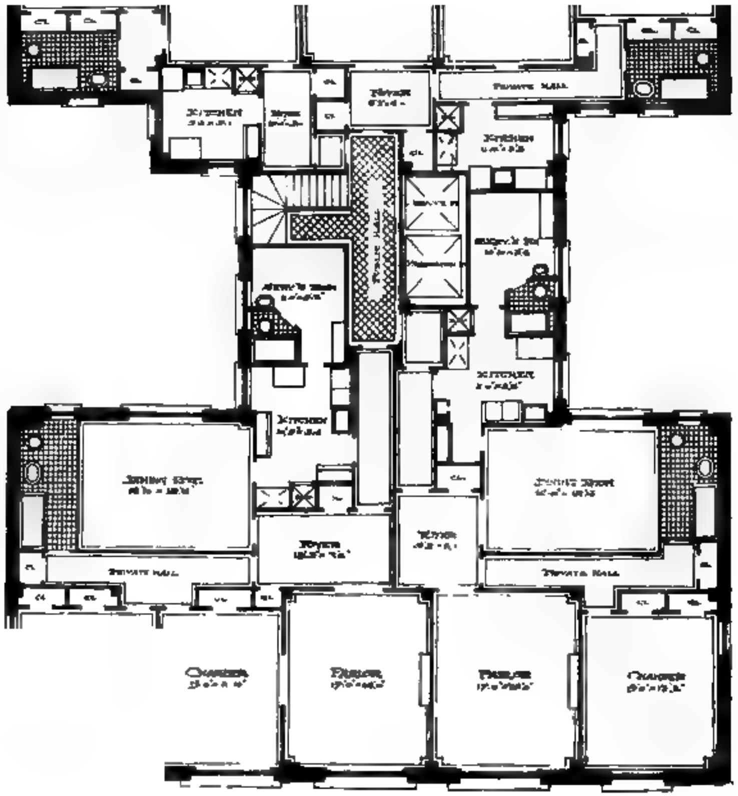
Rugs: James McCreery & Co.
Lighting Fixtures, Consolidated Chandelier Co



ETON AND RUGBY HALLS, 29 AND 35 CLAREMONT AVE., NEW YORK.

G. Ajello, Architect.

Builders: B. Crystal & Son.
Terra-Cotta: N. Y. Architectural Terra-Cotta Co.



TYPICAL FLOOR PLAN

THE LUCANIA, 235 WEST 71ST STREET NEW YORK

G. Ajello, Architect.

Builders, A. Campagna Construction Co.
Interior Marble: Voska, Foelsch & Sidlo Inc.
Decorations: Alberto Buccini
Painting: Andrea Ognibene

Rugs: James McCreery & Co.
Light Fixtures: Consolidated Chandelier Co.
Heating and Ventilating: E. Skinner

THE REGNOR, 601 WEST 115TH STREET, NEW YORK

Builders: Paterno Bros., Inc.
Rugs: James McCreery & Co.
Interior Marble: Voska, Foelsch & Sidlo, Inc.
Lighting Fixtures: Consolidated Chandelier Co.
Decorations: Alberto Buccini.
Painting: Andrea Ognibene.

THE REXOR, 600 WEST 116TH STREET, NEW YORK.

G. Ajello, Architect

Terra Cotta: New Jersey Terra Cotta Co.
Interior Woodwork: Kertscher & Co.
Enameled Brick: American Enamel Brick and Tile Co.
Heating and Ventilating: E. Skannel.
Bathroom Accessories and Hoegger "Surelocks": J. A. Hoegger.

THE REGNOR HALLWAY.

Rugs: James McCreery & Co.

Interior Marble: Voska, Foelsch & Sidlo, Inc.
Lighting Fixtures: Consolidated Chandelier Co.

THE MIRA MAR HALLWAY

G. Ajello, Architect.

THE MIRA MAR, 118TH STREET AND RIVERSIDE DRIVE, NEW YORK.

Builders: B. Crystal & Son. G. Ajello, Architect.
Terra Cotta: New Jersey Terra Cotta Co.
Otis Elevators.
Evans' "Crescent" Expansion Bolts Used

APARTMENT HOUSE, 86TH STREET AND WEST END AVE

Mulliken & Moeller, Architects.
Front Brick: Harbison-Walker Refractories Co.
Terra Cotta: N. Y. Architectural Terra Cotta Co.
Painting: John Wegmann.

APARTMENT HOUSE, 86TH STREET AND WEST END AVENUE, NEW YORK.
Decorations and Hangings: John H. Hutaff. Mulliken & Moeller, Architects.

APARTMENT HOUSE AT 118 EAST 54TH STREET, NEW YORK.

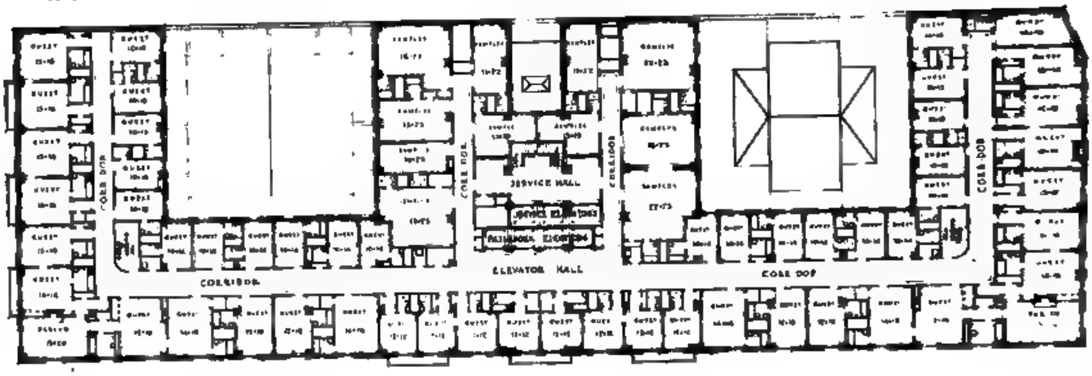
Builders: Theodore Starrett Co. — Cross and Cross, Architects.
Painting and Decorating: The Barker Painting Co.
Otis Elevators.

"EQUALITE" GLASS SEMI-INDIRECT CEILING LIGHT. 72 INCHES IN DIAMETER.
Made By Bayley & Sons.

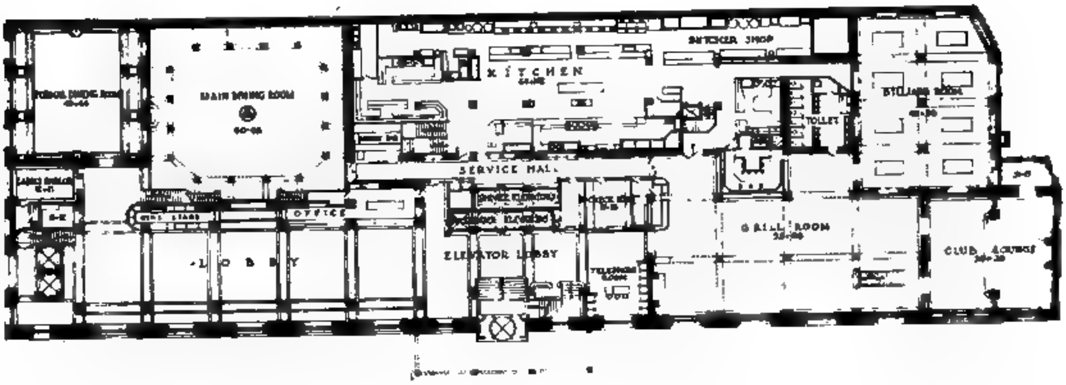
ELTINGE THEATRE.
Mural Painting and Decorations: Arthur Brounet
Thomas W. Lamb, Architect.
Star Expansion Bolts Used.
Keystone Flat Finish Used.

THE ELTINGE, 42D STREET THEATRE.

Rockwood Automatic Sprinkler Equipment. Thomas W. Lamb, Arch
Evans' "Crescent" Expansion Bolts Used.
Otis Elevators.



TYPICAL FLOOR PLAN



THE HOTEL STATLER, CLEVELAND, OHIO.
Corbin Hardware George B. Post & Sons, Architects.
Limestone: Ingalls Stone Co.
Ornamental Iron: Winslow Bros. Company.
Steel Doors, Bronze Doors and Trim: Interior Metal Mfg. Co.
Rugs: Bollentin & Thompson
Star Expansion Bolts Used.
Otis Elevators.

THE HOTEL STATLER, CLEVELAND, OHI

GEORGE B. POST & SONS, Architects.

CLEVELAND now has its new Hotel Statler, designed in the Adam style by George B. Post and Sons. It is built of red, wire-cut brick, with lower stories and top of limestone and terra-cotta. It is characteristically a hotel design, and displays the influence of our present day architectural habits.

The main lobby is entered from Euclid Avenue and runs half the depth of the building, with another entrance at its far end on East Twelfth Street, opposite the elevators. It is the main thoroughfare of the hotel as well as the lobby and waiting room, its alcoves furnishing space for waiting guests and visitors and its central passageway giving access to the desk, elevators, telephones and various stalls. Opening off of it are all the main rooms of the hotel, and overlooking it is a mezzanine, off of which are to be found the public rooms set apart distinctly for the use of guests and secluded from the transient visitor. The lobby is in Botticino marble with a color scheme of blue, old ivory and gold, the shallow vaulted ceiling being in low plaster relief. The furnishings consist of rugs of Chinese pattern, with furniture in Italian walnut, the chairs and lounges being luxuriously upholstered.

Of interest in the planning is the location of the grill, club lounge and billiard room at one end of the first floor. These rooms open directly from the lobby and are a distinct portion of the building set aside for men's use. They are luxuriously furnished and equipped. Another interesting point is the location of the kitchen on the first floor level, connecting with the dining rooms and grill through direct service halls, thus eliminating the necessity of stairways. Above the kitchen o mezzanine level is a large service from which service to the banqu and private dining rooms is mos venient.

Yet we must not lead the rea suppose that the efforts of the tects were confined solely to the rooms, for a visit to the guest shows that almost equal attentio bestowed upon the detailing c chambers and parlors. Herein li of the pleasures of the designer ing in Adam style. He has unli possibilities in his building; a rooms are open to him. The pa a suite or the great ball room ar susceptible to a harmonious sympathetic treatment; in the room a wealth of ornament, i smaller and more intimate chan plain treatment, yet with the two together in architectural spirit, finding its place in the great co tion that makes the whole. To su fully style such a structure is a c ble feat, and the present renditio be judged from the accompanying trations.

The site occupied by the build 104 by 379 feet. The building co seven hundred guest rooms and an number of baths, one for each The structure is of steel, firep with concrete and hollow tile. woodwork throughout is of mah and the doors and trim, moulding furniture are all designed with an ance of hollows and recesses tends towards cleanliness, makin possible the lodgment of du crevices.

Throughout the service portior trim and doors are all hollow

HOTEL STATLER, CLEVELAND. THE POMPEIAN ROOM.

Tile for Columns Mueller Mosaic Company.
[illegible]

George B. Post & Sons, Architects

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the water to suit for either shower or bath. All the bathroom fixtures back on vent shafts, the plan being so arranged that the vent shafts run between two bathrooms. These vent shafts contain all the piping and the shortest connection from the fixtures is provided to the vertical plumbing lines. Valves to the fixtures are located in the shafts. The bathroom equipment throughout is standardized, being reduced

Tiling, Wm. H. Jackson Co.
Tiles Furnished by American Encaustic Tiling Co., Ltd.

A TYPICAL SHOWER BATH.
Equipment: Hoffmann and Billings Mfg. Co.
Tiling: Wm. H. Jackson Co.
Tiles Furnished by American Encaustic Tiling Co., Ltd.

to a few standard arrangements. Access to the shafts is obtained in each bathroom through an opening behind the medicine closets, which have no outer doors and are recessed into the wall.

The elevators are grouped in one battery, there being four passenger cars backed by three service cars. The passenger cars open into a public corridor and the service cars into a service hall on each floor. In this way the two systems are separated and the large size of the service hall provides ample room for baggage without cluttering up the public passageways.

The builder of the Hotel Statler was J. L. Stuart. The exterior limestone was supplied by the Ingalls Stone Company, and the ornamental iron work was done by Winslow Bros. Company. The Interior Metal Manufacturing Company supplied the fireproof steel doors, bronze doors and metal trim throughout. The non-bearing partitions are of gypsum blocks.

The William H. Jackson Company put in the tiling in the 700 bathrooms and the barber shop, making a clean and sanitary wall finish. The tiles were furnished by the American Encaustic Tiling Company, Ltd. The equipment of the shower baths with the regulating devices was installed by Hoffmann and Billings Manufacturing Company.

Floor tiles in the dining rooms of the main floor were supplied by the Mueller Mosaic Company. In the Pompeian room a special tiling was used as a wainscot about the columns. The rugs throughout the lobby were furnished by Bollentin and Thompson. The mechanical equipment of the building is motor driven and there are 40 Sprague electric motors in use which were made by the Sprague Electric Works. The hardware throughout, which is of special design, was made by P. and F. Corbin.

MOTOR DRIVEN PUMP.
Electric Motors: Sprague Electric Works.

STORE FOR L. BAMBERGER & CO., NEWARK

JARVIS HUNT, Architect.

DEMOLITION of the old buildings on the site of the new Bamberger store began in February, 1911. Its progress early in 1912 is shown by an illustration, and the finished building was opened October 16th. The building is of L-shaped plan, with a frontage of 144 feet on Market Street, 235 feet on Halsey Street, and 117 feet on Washington Street. It is eight stories high with basement and sub-basement. The ceiling height of the main floor is 18 feet, and the basement and other stories are of good height, aiding the natural lighting and ventilation. There are six entrances to the store, five for the public and one for employees. There is an Otis elevator equipment of ten public passenger cars divided into two batteries of five each, one car for employees, and five for freight. The public passenger cars are 5½ feet deep and 8½ feet wide. The doors open the entire front. In addition to the elevator equipment there is an escalator equipment from the first to the sixth floor, capable of carrying 4,000 persons an hour. The t
mated capacity of this traffic e
is 200,000 persons a day. Th
combined ventilating and heat
tem with air washer capable of
air supply of 225,000 cubic
minute.

The store is most efficiently
and laid out as to its sales depa
there being wide aisles betw
counters, and there has been
provision for the convenience a
fort of the store patrons. The s
tures throughout are of mahog
there is a profusion of chairs of
types for the convenience of pu
in the various departments. T
6,626 feet of wall cases, 3,233
show cases, 2,073 feet of count
745 tables of different sizes. T
floor space is over 500,000 squ

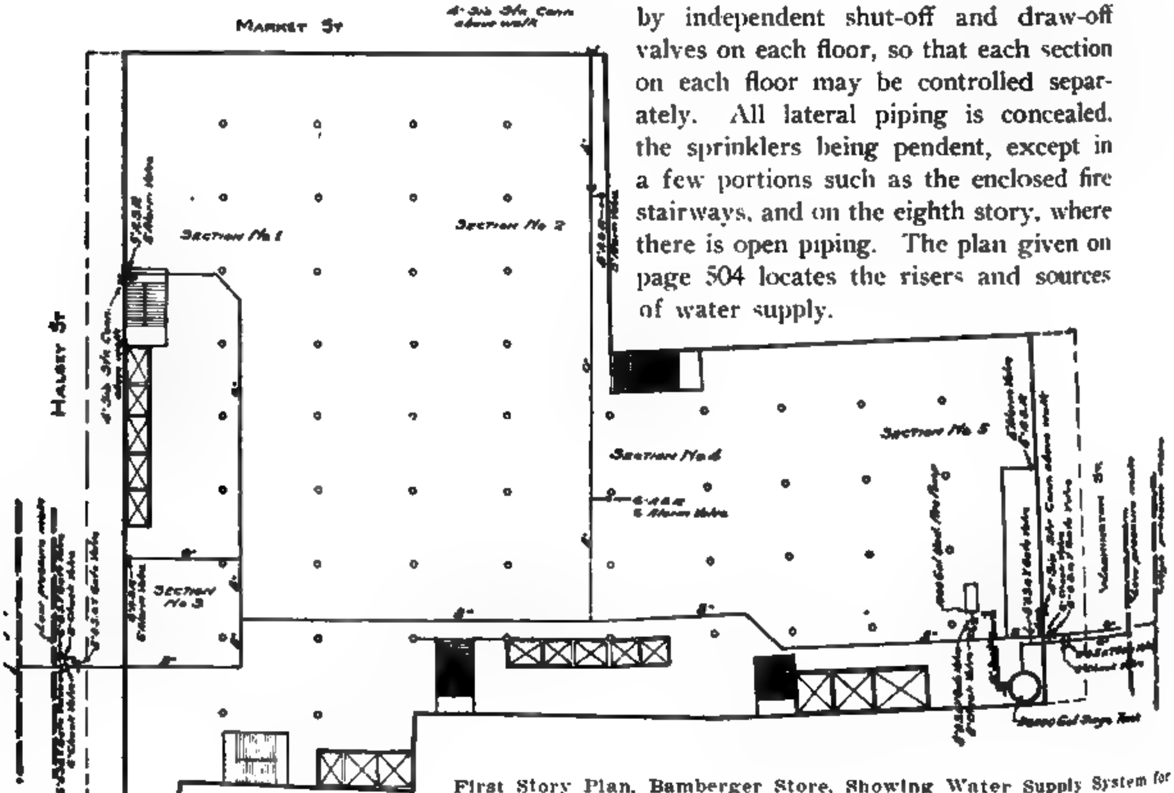
The entire building is equipp
automatic sprinklers, installed
General Fire Extinguisher C
There are 6,100 Grinnell heads
system, divided into five sectio
section having a 6-inch independ

MARKET STREET STORE FRONT.
Ornamental Iron Windows: The Winslow Bros. Co.
Architectural Terra-Cotta: Federal Terra-Cotta Co.

Fire Stairway Enclosure in Iron and Wire-Glass.

An Otis Escalator. There Is One on Every Story.

throughout the building and controlled by independent shut-off and draw-off valves on each floor, so that each section on each floor may be controlled separately. All lateral piping is concealed, the sprinklers being pendent, except in a few portions such as the enclosed fire stairways, and on the eighth story, where there is open piping. The plan given on page 504 locates the risers and sources of water supply.

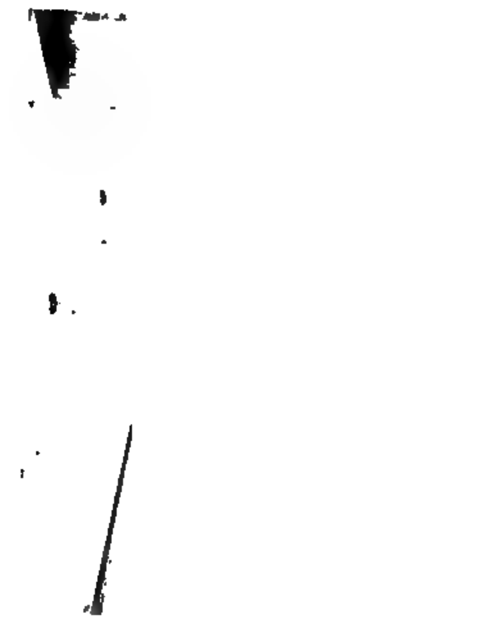


First Story Plan, Bamberger Store, Showing Water Supply System for 6,100 Grinnell Automatic Sprinklers.

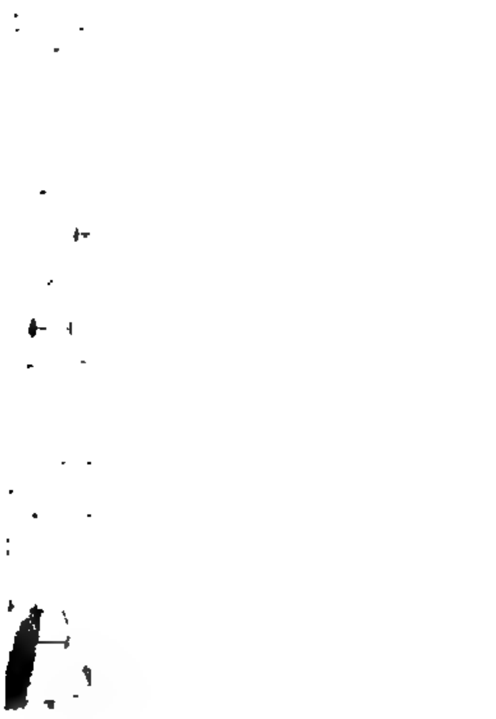
"Peelle" Counterbalanced Fire Doors.

THE BAMBERGER STORE. A MAIN FLOOR COUNTER AND THE RESTAURANT ON THE FIFTH FLOOR.

Bent Wood Chairs Jacob & Josef Kohn. Jarvis Hunt, Architect.
Fixtures Made and Erected by The Robert Mitchell Furniture Co.
Grinnell Automatic Sprinkler Equipment.
Tiles Furnished by American Encaustic Tiling Co., Ltd.
Lighting Fixtures: The Browe Co. Keystone Flat Finish Used.
Spencer Turbine Vacuum Cleaning System.
Kitchen Equipment: Bramhall, Deane Co.



WALL PAPER DEPARTMENT



WAITING ROOM

The water supply comes from one 8-in. and one 6-in. connection to city high pressure, feeding the sprinklers at a pressure of 140 lbs. per sq. in. at the base of the risers. There are also two 6-in. connections to city low pressure water supply, which is about 35 lbs. per sq. in. A second source of supply is from a thousand-gallon per minute steam underwriters' fire pump taking suction from a suction tank in the sub-basement, which is fed automatically from the city mains. In addition the sprinkler system can be fed by the city fire department through a series of outside Siamese fire department connections so arranged that the entire system may be fed from any one of the connections.

THE BAMBERGER SODA FOUNTAI...
Haussling Soda Apparatus Mfg. Co.
Bent Wood Stools: Jacob & Josef Kohn.

There is a supervisory system connected with the sprinkler system, each valve having an alarm device so that if it is tampered with or disturbed, an alarm is immediately communicated to the engine room on the premises, and at the same time to the headquarters of the American District Telegraph and Messenger Company in Newark. In this way the entire sprinkler system is under supervision day and night.

The George A. Fuller Company built the Bamberger store. The architectural terra-cotta, which is largely the exterior material, was made by the Federal Terra-Cotta Company. The ornamental iron windows and interior work were done by the Winslow Bros. Company. The William G. Maher Company were the carpenter contractors. Cathcart and Kissell did the plastering, and Arthur Greenfield, Inc., supplied the metal lath. Isaac Cohn did the painting and decorating, and tiles for flooring were supplied by the American Encaustic Tiling Company, Ltd.

The store fixtures were manufactured and erected by the Robert Mitchell Furniture Company, and bent wood chairs and store furniture used by the customers throughout the store were made by Jacob and Josef Kohn. Rubber mattings and perforated mats were supplied by the New Jersey Car Spring and Rubber Company. The soda water fountain was installed by the Haussling Soda Apparatus Manufacturing Company, and is chilled by brine pipes from the central refrigerating system of the store. The lighting fixtures were put in by the Browe Company. Metropolitan detachable mechanical flush switches were used throughout. The vacuum cleaning system is a 25 horse-power ten sweeper equipment installed by the Spencer Turbine Cleaner Company. Newman watchman's clocks are used by the watchmen in the building. "Peelle" counterbalanced fire doors were used at all freight elevator openings.

THE ESCALATOR FOR DEPARTMENT STOI

By S. P. RING

THE standard height of modern tall buildings in New York City may be considered at present to be thirty stories. Towers like those of the Metropolitan, Woolworth and Singer buildings rise to a still higher level. There were two problems which had to be solved before such a standard became possible. One of these problems has to do with carrying foundation construction to bedrock or at least to hardpan. Engineers and contractors concerned especially with foundation work have solved this problem splendidly. The other problem awaiting solution was that of making each one of the thirty stories almost as accessible as the one on the level of the street. The modern elevator is the magnificent solution. With a full equipment of "express" and "local" elevators, a modern tall structure may have thirty stories, the rental value per square foot of area being approximately the same in all. A very considerable number of people visit such a building daily, but the number is not enormous. The problem is to handle a moderate stream of people with swiftness and certainty. This the elevator does.

With the great department store, however, the problem is quite different. At certain hours of the day the number of visitors, in comparison with the floor area, may become very large. The elevators move swiftly enough, it may be, but they do not have sufficient capacity. People have to wait, or are driven to the stairways, or conclude they will not visit the upper floors at all. Then, again, those who enter a department store pay little attention to the location of the "main" entrances. They enter where most convenient. There is a not lustration of this fact at Macy's, the large New York department The main entrance on Broadway, about midway along the front is very moderately patronized. in considerable numbers come in corner, south of this entrance. congestion of the crowds frequer curs. What a department store n to state the matter broadly, an ec tion of the distribution of cus over the entire area of a floor; addition, an equalization of the a bility of the various floors. As tion of this problem, the elevat been found wanting. Thus, in tl of local congestions on the groun it is only very moderately suc because the capacity of elevators pose of larg numbers of people is not great. An elevator will r small number of people with some ity; but the total number of tri hour is limited, and, consequent aggregate volume of passenger handled is only moderate. In words, the number of people mov hour from a congested locatio square foot of floor space occup the elevator, is insufficint to co partment store requirements. Sir the elevator seems incapable of porting sufficiently large numb people from story to story to e them all, when due regard is economy of space occupied by t vator equipment. No doubt enou vators could be installed to han crowds and thus equalize the sto thoroughly as is the case with th building. But the sacrifice of floo

makes this impracticable. Another solution must be found, and we may revert to the stairway. It is probably necessary to furnish buildings with stairways, irrespective of the presence of other and mechanical methods, because of the necessity of providing exits for fires and other emergencies. But the use of a stairway, aside from other considerations, is distasteful to the customer. It represents hard work. We turn, then, from elevator and stairway as only partial solutions. The escalator, it is thought by many, may solve the problem. Here we have a device which never stops its motion. Its speed is always the same. It is not particularly rapid, and it is not advisable that it should be, under present conditions. It is less than the speed of the elevator when the latter is fairly under way, there being no stops, however, and no slow-downs. Because of the *continuity* of its operation, it really has a good average speed, and is thus able to handle a great number of people. An escalator is really a moving platform, terraced in the region of ascent, and moving at the rate of about 100 feet per minute. As the sections are each 18 inches wide, this means that sixty-seven of them are delivered each minute. Now, if the platform be 4 feet wide, each section may be estimated as having room for three persons; so that there is an escalator capacity of two hundred persons per minute, or twelve thousand per hour. This is certainly "handling people," and by a device, too, which occupies but little, if any, more room than that occupied by a stairway. An escalator placed, then, at a congested point in a department store, may be expected to draw off people in a wonderful way and deliver them to one of the upper stories. Furthermore, by connecting all the floors with ascending and descending escalators a very great deal is done towards equalizing the accessibility of the different stories. When we have made possible the circulation of a stream of people at the rate of twelve thousand per hour, we have done much. If the conditions of the store have been sufficiently studied by the architect and others, it should be possible to place escalators so that there will be no congestion centers, and the upper stories will be approximately as accessible as the first. It is held by many that this would work out a wonderful revolution in department stores in the direction of economical management. As the case stands to-day, the upper stories have a much lower value per square foot than, say, the ground floor and the one just above it. Some of these stories are visited daily by comparatively few people. A great deal of space is given up to relatively unproductive departments, largely because a better disposition cannot well be made. If the fifth story were *obviously* easy to reach, it could be given over to departments earning a much larger profit per square foot of floor space than that resulting from the present occupants. It is now difficult to get people to such stories unless they are spurred on by some necessity or contemplate a considerable purchase. But with the introduction of some method, conspicuously easy, or reaching any story whatever—some contrivance adequately handling a large number of people—the store could allot floor space to its various departments somewhat in accordance with their money-making power. The problem of equalizing this earning capacity of the different stories of the department store has not been sufficiently studied; but while, generally speaking, the architect has not yet given it sufficient study, its importance is unquestioned. If the upper three stories can be made as acces-

sible as the lower three are at present, fifty per cent., perhaps, can be added to the value of a six-story building. It is precisely a similar question to that concerning the relation between land values and railways. Without adequate transportation facilities, the best land has an insignificant value, while with them the value goes up enormously. This is well understood and very thoroughly appreciated. The same conditions exist in a department store. If the fifth story is difficult of access for large numbers of people, its value per square foot is low; if *evidently* easy of access, the value goes up.

There are however, situations in which the escalator is not advisable. If the number of people to be moved is inconsiderable it should not, ordinarily, be installed. It is in point of *capacity* that this apparatus is of pre-eminent value. If a department store has no considerable number of customers through its entrances daily, it is not needed. The elevator solves whatever problem there is, and at less expense. But do not let us make a mistake here. The number of visitors to the upper stories may be to-day inconsiderable, and the escalator still profitable. It all turns, largely, on the number who enter the store from the street. The fact that only a comparatively small number find their way to the upper stories may be precisely because of the difficulty of getting there. It is no answer to say that these upper stories are devoted to furniture and the like, and that, therefore, only a few people are expected. With the escalator, large numbers can reach these stories; and this permits of rearrangement of space throughout the various departments in accordance with their income-producing value. If a sufficient number of people enter the store, the escalator enables the owner to plan the interior arrangement of his departments relatively to their value to him. This is most important.

THE ESCALATOR IN USE. AN ADJOINING STAIRWAY DOES NOT MEET WITH POPULAR FAVOR.

ESCALATOR LEADING TO 34TH STREET FROM THE PENNSYLVANIA STATION, NEW YORK.

A consideration of the advantageous circulation of visitors to a department store affects not only the proper distribution and allotment of space, but also the design of the building itself. Thus the architect who wishes to construct a building for his client, and to arrange it

most advantageously, will have to consider the probable circulation when aided by escalators. This consideration may very well affect the size and distribution of street entrances. If a building is already completed, the architect may not be able to arrange the installation of escalators to the greatest possible advantage; but their installation even then will ordinarily greatly improve the handling of large masses of people. If, however, at the time the plans are drawn, the architect takes into consideration the effect of escalators in facilitating circulation, he will be able to obtain very much better results. This statement is based on the assumption that the architect is thoroughly familiar with the possibilities involved in their use. Those architects who may be called upon to design great stores should look upon this subject as one calling for serious study.

The comparative merits of stairway elevator and escalator may be tested by studying their use in a very large building, such, for example, as Macy's department store, in New York. This store is provided with suitable stairways, an equipment of fourteen elevators and a series of escalators. During one afternoon in December, 1906, three days before Christmas, and at a time when there were a large number of people in the store, a count was made of the number of those arriving by the three methods at the second, third, fourth and fifth stories. Of the total number of those arriving, thirteen per cent. came by the stairways, thirty per cent. by the elevators and the remaining fifty-seven per cent. by the escalator. That is to say, the single escalator service was doing nearly double the business done by the fourteen elevators. This is a significant fact. Considering the totals for the four upper stories, the stairways were nowhere. And yet, if we consider the second story alone, the stairway shows up very well. The percentages here, disregarding all the stories above, were, respectively, thirty-four, sixteen and fifty. Those who went to the three upper stories by the stairways were very few in number, almost a negligible quantity. All this shows that people who wanted to go to the second story were quite ready to use the stairways.

As far as any extended use is concerned, the stairway is, of course, obsolete. But if a building has but a single story above the ground level, it would not be unreasonable to use stairways alone. There would be little or no use of installing elevators, as the sixteen per cent. shows. Two-story department stores, however, are themselves pretty nearly, if not quite, obsolete. The question, then, that we have to consider is with reference to the comparative merits of the elevator and the escalator. In the third story the deliveries from the elevators were less than half what they were from the escalator. In the fourth story the ratio was ten to nine in favor of the escalator. The result in this story was perhaps not quite fair to the elevators, as the attractions there were not such as to draw many people. The escalator itself, however, was put to little use. In the fifth story the ratio turned in favor of the elevators, and was about three to two. We learn, then, that if a passenger wanted to go to the fifth story he would be more likely to take the elevator. In regard to the other stories, as between elevator and escalator, he would take the latter, the ratios in the various stories in its favor being, beginning with the second story, three to one, two to one, and ten to one. The first group of percentages showed that for all stories above the street level, considered together, the ratio in favor of the escalator was nineteen to ten.

The foregoing considerations are per-

haps insufficient to warrant the entire elimination of the elevator. But possibly they are quite sufficient to impel one to give serious consideration to the question as to whether it would not be better to reduce the elevator equipment usually installed in the modern department store and to increase the number of escalators. A passenger who proposes to go as high as the fifth story will perhaps prefer the elevator. For the other stories, he chooses rather to go by the escalator. If this statement of the case is correct, then the rule appears to be: use a few elevators for the upper stories and escalators for the others.

In the Pennsylvania station on Seventh Avenue, New York, the trains enter by tunnels, and discharge their passengers far below the street level. Under such conditions, it will be seen at once, that the problem is one of transportation to the street. It is too much to ask the passenger to go up by the stairway, if he does not care to do so. If a railroad company fails to provide some positive mechanical appliance for taking people up to the street from the lower levels, it fails in the matter of completing the transportation of its passengers. Surely no one wants to be set down by a railroad company at the bottom of a hole in the ground. While elevators have been tried in such situations, it has been found that any reasonable equipment of them is totally inadequate for carrying off a crowd of people with proper dispatch; and it is just here that the escalator is indicated as the solution of the problem. A moderate-sized escalator is able to take care of a great number of people very expeditiously. This is because it never stops, and does not, as a whole, have to return to the point of starting, as does an elevator which serves the sub-surface platform of a railway. On the Thirty-fourth Street side of its great station, the Pennsylvania Railroad Company has installed a fine escalator. A stairway is arranged at one side, so that the comparative popularity of the two may be readily noted. The escalator here is constructed all in one flight, as there is no reason for passengers getting on or off between the termini. The rise amounts to 35 feet, equivalent, say, to the elevation above the ground level, of the third story of a department store. In the comparison between the stairway and the escalator and in respect to the number of passengers discharged in the third story at Macy's, the ratio in favor of the escalator was fifteen to one on that afternoon of the Christmas shopping period. The comparative popularity of the two at the Pennsylvania Railroad Station would appear to be in accord with this, the ratio being perhaps still more largely in favor of the escalator.

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BOOK REVIEWS

PRACTICAL STEAM AND HOT WATER HEATING AND VENTILATION, by Alfred G. King. 367 pages, 300 illustrations. Cloth. New York: The Norman W. Henley Publishing Co. Price, $3.

This latest book on the subject of steam and hot water heating is intended for the use and education of all who are engaged in the business, particularly the steam fitter, and is an original and exhaustive work. As much of the matter ordinarily included in books of this character and in the articles on the subject published in the trade magazines, is too technical to be readily understood by the man who has most need of it—the steam fitter—Mr. King has eliminated all technicalities and reduced the subject to terms easily understood by the man of average education.

All of the principal systems of steam, hot water and vacuum heating, together with the up-to-date methods of ventilation and the fan or blower system of heating and ventilation, are simply and clearly described. The author has rather commented on than criticised the various systems in use at the present time, and aims to instruct the steam fitter in a practical way regarding their application and installation. Together with the foregoing, the many tables, rules, etc., given at the end of the volume, should make this a very valuable and instructive reference book for the contracting steam fitter.

ENGLISH AND WELSH CATHEDRALS. By Thomas Dinham Atkinson. Illustrated by Walter Dexter, R. B. A. XXXV + 370 pages. Cloth. Little, Brown & Company, Boston, Publishers. Price, $3.50 net.

In this very beautiful book the author has sketched the histories of the Cathedral Churches of England and Wales in their broader aspects, connecting each as far as is possible with the main stream of architectural history. The result is a volume of highly interesting information presented in a most readable manner. In order to carry out his scheme of arrangement, Mr. Atkinson has treated the Cathedrals in groups: First the Canons' Churches, of which St. Paul's, Chichester, Salisbury and Exeter are notable examples; then the Monks' Churches, the Foundations of Henry VIII, and the New Sees. Although the form of the book is that of a history, the author has approached the subject from his own point of view, which is that of an architect and constructor.

The book is beautifully illustrated with 20 color plates, 20 plates in monotone, and 48 plans. It will be of great interest to those travelers who have visited the old Cathedrals and are thus familiar with them; and for those who are unfamiliar with the Churches the book gives in its text and illustrations much very valuable and interesting information. The arrangement will be found very satisfactory and convenient for the general reader as well as the student.

ANALYSIS OF PAINT AND VARNISH PRODUCTS. By Clifford Syer Holley. Small 8vo; VIII + 292 pages, illustrated. Cloth. New York: John Wiley & Sons. Price $2.50 net.

As in the case of many other prepared or ready-mixed products, large quantities of paint are sold to-day more on the strength of the vigorous advertising by the manufacturers than on the merits of the article itself, and the many instances of detected fraud have resulted in numerous state laws requiring that the composition of each paint product be printed on the label. These laws and the discussions resulting therefrom have done much to stimulate the chemical analysis and research work with the various paint products. Many new combinations are being placed on the market, and in spite of the labels, the consumer must rely on the chemist for his knowledge of their value and suitability for use. The paint chemist of to-day must therefore be not only accurate, but capable of securing results with the greatest possible rapidity.

In this volume the author has presented methods which he has found to be accurate and at the same time rapid and convenient. Many new methods are introduced with many new paint products whose properties are discussed, and a large amount of data relative to the composition of the various paint specialties to be found on the market has been included.

MECHANICAL EQUIPMENT OF FEDERAL BUILDINGS UNDER THE CONTROL OF THE TREASURY DEPARTMENT. By Nelson S. Thomas. Cloth. 6 by 9 inches. 278 pages and diagrams. Baltimore: Williams and Wilkins Company. Price, $2 net.

This book contains a mass of technical information which is collected under several chapter heads and carefully referred to by an index in the back of the volume. The index is sub-headed, with references to the various portions of the book. The subjects included are heating and ventilation; plumbing, drainage and water supply; gas piping; conduit and wiring systems; lighting; elevators; small power plants; motors and controlling apparatus; vacuum cleaning systems, and operating data. In an appendix under the head of

(Continued on page 21.)

Art and Architecture

ARCHITECTURAL LEAGUE 28TH ANNUAL EXHIBITION.

The exhibition will be held in the galleries of the American Fine Arts Society, 215 West 57th Street, beginning February 2d and ending February 22d.

The last day for the entry of slips is Monday, December 30, 1912. These slips may be obtained from the secretary, as well as a circular of information giving full particulars for exhibitors, and information concerning members of the jury of selection and the prizes to be awarded.

The annual dinner of the Architectural League will be held on Friday, January 31st, and the reception on February 1st from 3 to 6 P. M., the public exhibition opening the next day. The regular admission fee is 25 cents, while on Saturdays the exhibition is free to the public.

Mr. Frederick Crowninshield, who was formerly Director of the American Academy in Rome, gave a talk illustrated with lantern slides concerning Municipal Art in Italy, in the galleries of the National Arts Club, on December 11th. This address was held under the auspices of the Municipal Art Society, and was delivered before a large and interested audience.

The Municipality of Wilmington, Ohio, is in the market for plans and specifications for a memorial building. They would be pleased to hear from architects within the next thirty days. Information may be obtained from Mr. J. W. Lawhead, of Wilmington, Ohio.

The Winter Exhibition of the National Academy of Design, which opened in the galleries of the American Fine Arts Society on Saturday, December 14, will continue until Sunday, January 12, 1913.

At the annual meeting of the San Francisco Chapter A. I. A. held on October 17, 1912, Mr. George B. McDougall was elected president, Mr. Edgar A. Matthews, vice-president, and Mr. Silvain Schnaittacher, secretary and treasurer. Mr. William Mooser and Mr. W. B. Faville were elected trustees. Following the election of officers, there were appointed various committees for the conduct of the Society's activities during the coming year. The meeting was well attended, and besides the usual reports of officers, several matters of general interest were presented.

ADDRESS BY AUSTIN WILLARD LORD, NEW DIRECTOR OF THE SCHOOL OF ARCHITECTURE, COLUMBIA UNIVERSITY.

On the occasion of a social meeting of the alumni architects of Columbia University on October 22d, Director Lord gave an address which was in the nature of an inaugural. His remarks, which are too extensive to be published here in full, were very interesting, and his definition of an architect is a good one.

"A man to be an architect should have a trained sense of proportion which should enable him to combine beautifully materials to be used in construction."

Mr. Lord outlined the forces that work to produce architecture and discussed the method of architectural teaching, suggesting that to organize the profession there should be one central school of art in this country which would develop the student under the most favorable conditions. Going further, he outlined the methods which he personally was endeavoring to follow and defined his purposes very clearly.

A COMPETITION.

The Congress of Haiti has appropriated the sum of $100,000 for the construction of a new palace at Port-au-Prince, and will award first, second and third prizes of $500, $250, and $200 to Haitian and foreign architects and engineers. American architects who wish to compete are required to send their plans to the Department of Public Works, Port-au-Prince, Haiti, before February 4, 1913. Further particulars may be obtained by addressing Franklin Adams, Chief Clerk of the Pan-American Union, Washington, D. C.

THE ELTINGE THEATRE.

To suit the nature of the playhouse, the decorations in the Eltinge Theatre are of a novel and interesting character, and they are lavishly and artistically carried out. Arthur Brounet, of 1133 Broadway, New York, is the artist who brought to accomplishment the mural paintings and decorations which attract and hold the eye in this interesting playhouse.

Another interesting feature of the theatre is the semi-indirect lighting which is accomplished by "Equalite" glass shades and lighting fixtures. The great central light over the auditorium is an unusually large piece of glass, being 72 inches in diameter and handsomely decorated. It presents a beautiful appearance from the suffused light, and effects a splendid lighting of the interior, displaying the decorations and proscenium painting by Arthur Brounet to the best advantage. Bayley and Sons, of 36 West 28th street, manufacture this glass.

ENGINEERS' DIRECTORY

(Book Reviews, continued from page 18.)

"commercial practice" is much information concerning factory heating and various heating appliances; a chapter on heating and forced circulation by hot water from a central station; one on general instructions issued to draftsmen by the chief mechanical and electrical engineer in the office of the Supervising Architect, and a chapter of suggestions to superintendents of construction.

The book is one that will prove of great value to the architect who supervises his own construction and other superintendents in charge of building mechanical equipments.

FRESH AIR AND HOW TO USE IT. By Thomas Spees Carrington, M.D. The National Association for the Study and Prevention of Tuberculosis, publishers. Cloth, 5½x8; 250 pages, 150 illustrations. Price, $1.00.

This book enters into the architectural field, as it shows and describes every conceivable development of outdoor porch or sleeping room or device which has been devised for the fighting of tuberculosis. In text and by illustration all subjects are clearly presented. The chapters cover ventilation, describing methods of screening and utilizing the open window, window tents, which tell of every useful device, roof bungalows, wall houses and frame [
for city use, temporary fresh air porc[
permanent sleeping porches for the [
Further chapters deal with protecti[
screening porches, tent and tent hous[
air bungalows and cottages. Furthe[
are suggestions for planning new hou[
open air apartments and plans and illus[
of roof playgrounds for children, while
part of the book is devoted to the su[
clothing, bedding and furniture.

Often the architect is called upon [
open air quarters for the tubercular
and there is no doubt but that this bo[
broaden his ideas and offer him sug[
to meet any condition.

REPAIR KINKS FOR PLUMBER[
Martin L. Kaiser. Cloth, 69 page[
trated. Second edition, revised a[
larged. New York: The David W[
Company. Price, 50 cents.

This is a handbook of information
construction and repairing of applian[
domestic water supply and waste disp[
is a reprint from the Metal Worker, P[
and Steam Fitter. As the subject of
to plumbing work is much too large
covered in any one book of practica[
this little volume deals only with the
that have to be undertaken by the n[
of workmen in their daily work.

Fireproofing and Fire-Protection

MR. G. H. STEWART

A FIRE WITH A LESSON.

The firm of Emerson-Brantingham Co., Rockford, Ill., have had a fire—not an unusual occurrence for plants of this magnitude, nor for any plant, but this fire has been considered peculiar because it happened in a fireproof (so-called) building

The building was a three-story reinforced concrete structure with open stairway and interior trim and office furniture of wood, occupied as general office, show room, supply room and dining hall.

The details of the fire having been delineated in the report of the National Fire Protection Association, and commented upon in the November issue of this magazine, it will not be necessary to state them again. There was, however, a lesson taught by this fire which will have its effect upon the future equipment of buildings.

There was, to the casual observer, very little to burn in this building, but the burning of that little caused a big loss, and that is the peculiarity referred to, for in the eyes of most people the building was absolutely fireproof, and everything had been done in the way of making it safe.

It is gratifying to know that the experience of the loss had a proper effect upon the sufferers, and instead of merely replacing the burned or damaged property they went a step further and safeguarded against a future happening of like kind.

The following letter written by the superintendent of the above firm carries a message to every one which cannot be ignored if immunity from the ravages of fire is sought.

Rockford, Ill., November 19, 1912.
Architecture and Building.
New York, N. Y.

Gentlemen:

Replying to yours of the 4th, would advise that after our office fire in January, we equipped the building with Automatic Sprinklers. These sprinklers were installed by the Automatic Sprinkler Co. of America. Niagara heads were used, and they are hung pendent, which allowed the pipe to be placed close to the ceiling. The building in which this fire occurred was a reinforced concrete and brick structure. Therefore, there was nothing but the partition work and office furniture to burn. These partitions and furniture being made of veneered oak, caused a very hot fire. We really had no idea that it was possible for a fire to occur in this office building, and therefore was not equipped with fire pails and extinguishers, as we are in the factory buildings.

We have installed steel partition work and steel furniture throughout the building, therefore there is not much need of a Sprinkler Equipment. Yours truly,

EMERSON-BRANTINGHAM CO.,
W. C. Squier, Supt.

The expressions in this letter regarding the possibility of fire in a structure of this type are not original with this firm; it is a prevailing opinion among builders and is steadfastly adhered to by many people who are intelligent enough to read, and who have access to the data that could prove differently, that the building is all that it is necessary to fireproof and the contents, being in the building, are all right There can be no greater mistake than this, as this letter proves, for the acknowledgment of the necessity of replacing the wood furniture with metal is strongly evidenced by the fact that they have made this change. There are two truths concerning fires that must be borne in mind—all

(Continued on page 26.)

PROTECTED FROM FIRE BY

GRINNELL Automatic Sprinklers, supplied with water from three independent sources. In addition to this, the basements of the building are protected by the same means. Thus, the place where fire is most likely to start, and the place where a small fire would wreak the greatest destruction, have both been fitted with apparatus to discover and put out this fire before it can do serious damage.

Our little publication, AUTOMATIC FIRE PROTECTION, shows how the sprinkler system makes use of the heat of the incipient fire to Make the Fire Commit Suicide. It will take but a moment of your time to send for *your* copy—Do it today—before it slips your mind.

General Fire Extinguisher Company

Providence, R. I., and Principal Cities

Steam and Hot Water Heating and Power Piping Systems Laid Out and Installed

40-107

Enameled Brick in Standard Colors and Si

BRIGHT AND MATT FINISH

Permanent Office Buildings, Apartments and Stores, etc., erected for over fifteen years stand up in evidence of the **durability** of

Store and Apartment Building, 12th St. and Lackawanna Ave Chicago, Illinois

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WRITE FOR SAMPLES AND LITERATURE

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fires have small beginnings, and fire must have fuel in order to keep burning. The first truth is part of the Extinguishment Theory, which advocates the application of water at a fire's incipiency and thus prevent, heavy loss, while the second is part of a Prevention Theory that states, "if fire has nothing to feed upon it will not continue to burn and no damage results," therefore the last should be first and the first last if the best results are to be obtained.

The installation of metal trim and furniture in this building shows a progressive spirit in this firm that is well worth copying by others, for although it required a fire to teach them a lesson, their act proves the theory that they entertained as to the cause of its spread and the resultant damage.

The sprinkler installation is but a natural consequence after a fire here, for the remainder of the plant was springled and its extension to this building is a matter of small cost as compared to the whole. The sprinklers would now put out the fire, but the metal furniture and trim have also made the fire impossible.

The use of metal furniture is undoubtedly a most necessary movement in the prevention of fires and will gain in favor, if instances as stated above can be brought to the public notice and the lesson heeded by those who are re-equipping plants after modern methods. Metal trim is coming into its own as it rightfully should, and this is only one instance of the acknowledgment of its virtues.

The making of fireproof buildings should not stop with the floors and walls, but should include all trim, partitions and furniture, for a building is not immune from fire damage unless its contents are such that will not feed a flame and cause it to grow.

Where burnable stocks are kept the danger is increased, but in buildings that are used for purposes that do not include these stocks metal furniture and trim give a sure protection.

(Continued on page 30.)

The lesson before us is too obvious to escape, and the future should show a marked improvement in the equipment of buildings due to this fact.

The Emerson-Brantingham Company acknowledge that wooden furniture and trim must be replaced by metal if immunity from fire damage is to be expected, and we venture to remark that this should be good enough proof for any one.

FOREST FIRES.

The U. S. Department of Agriculture, Forestry Service, Bulletin No. 117, relates to forest fires and causes, extent and effects, with a summary of recorded destruction and loss, by Frederick G. Plummer. Another pamphlet, Bulletin 113, deals with methods and apparatus for the prevention and control of forest fires as exemplified on the Arkansas National Forest, by Daniel W. Adams. These two papers are of great value to the lumber industries and should be procured by every one interested in that line.

FIRE LOSSES.

The carefully compiled records of the Journal of Commerce and Commercial Bulletin show a total fire loss for the month of November in the United States and Canada amounting to $16,172,300. This loss is nearly two and one-half millions less than for the same month last year, and brings the total for the eleven months of 1912 up to $207,353,900, a total which is more than four and five millions less respectively than in 1911 and 1910 for the same period.

Last month we commented on the English fire loss, and while our figures were correctly stated, our comparisons were somewhat at fault in the transcription of pounds into dollars. While the British fire loss for September is £300,700, the loss of the United States and Canada for the month amounted to $13,779,300, a vast difference in totals.

Industrial Progress

A CATALOGUE OF SPRING HINGES.

The Chicago Spring Butt Company who have put their 30 years' experience as manufacturers of spring hinges to good advantage in the constant improvement of their various products, have issued a new catalogue, No. E29, which deals with the most complete line of spring hinges manufactured. Herein an architect or builder will be able to find hinges adapted to all the various requirements of a building, and in ordering have the assurance that he is getting materials of standard quality. The catalogue is well illustrated and contains tabulated information of the products with prices. Its central memoranda sheets are a very useful feature.

The catalogue gives valuable information in regard to specifying spring hinges, and the specification of lavatory hinges and fittings has been so simplified that the trade will have no difficulty in getting just what they require to meet the most varying conditions.

The Chicago trade mark is becoming well-known and it may be seen by those who are interested, on the hinges and trim of a very large number of our modern buildings. A letter of inquiry to the Chicago Spring Butt Company, of 334-340 Union Park Court, Chicago, will bring one of these catalogues to you at once.

INCLINED ELEVATORS.

The Otis Eleavtor Company has just issued a very carefully prepared catalogue illustrative of their inclined elevators, loading machines of various types and various forms of carriers. The arrangement of the catalogue shows a photographic illustration of the type of carrier on the left-hand page and on the opposite side of the page a side elevation drawing which clearly explains the arrangement of the mechanism.

Another pamphlet issued by the Otis Company is entitled "Elevator Service" and suggests the means of proper elevator maintenance, inspection and use of lubricants. This is a very valuable pamphlet and one that should be in the hands of every building superintendent and elevator operator or engineer, as it suggests the proper lubricants for use in the various parts of an elevator machine. These books may be obtained by addressing the Otis Elevator Company, Eleventh avenue and 26th street, New York City.

APARTMENT HOUSE AT 86TH STREET AND WEST END AVENUE.

A handsome feature of this well-planned apartment is the entrance hall which is treated in simple outline but is rich in decoration and coloring. The trim, door casings and wainscot are of marble, while the walls are hung in tapestry and the ceiling is a beamed effect ornamented in low relief. The decorations and hangings in this hallway and elsewhere in the house were carried out by John H. Hutaff, of 10 East 33d street, New York.

REFRIGERATORS.

Among the many fixtures which have been provided in the apartment building at 521 Park Avenue by Mr. William A. Boring, architect, none appeal more to the most discriminating than the refrigerators.

The smooth, solid oak cases without any paneling or mouldings are just right for the pantry or kitchen.

On opening the doors we find the food compartments just like a large china dish, snow white, with rounded edges and corners and without any joints or cracks. The sanitary permanence of these, which are each of one piece of solid porcelain ware, an inch or more thick and really unbreakable, is readily apparent; these having no joints or cracks or metal bands and screws or projection of any kind where dirt or moisture can lodge. They are just like and just as easy to wash as a china dish.

The five-inch thick walls strongly impress the economical operation of these refrigerators, which were made in Cincinnati by Tettenborn & Co., whose New York office is at 1135 Broadway.

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